# Pumping, Monitoring and Mitigation Plan (PMMP)

for

# Town of Hamilton Well 14 Stone Eden Well Hamilton, Virginia

Prepared for:

Mayor Ray Whitbey Town of Hamilton

Prepared by:

TRIAD Engineering, Inc.

210 N. 21<sup>st</sup> Street Purcellville, Virginia 20132

Date: October 15, 2007

TRIAD Project # 05-07-0092

# Pumping, Monitoring and Mitigation Plan (PMMP)

for

Town of Hamilton Well 14 Stone Eden Well Hamilton, Virginia

Prepared for:

Mayor Ray Whitbey Town of Hamilton

Prepared by:

TRIAD Engineering, Inc. 210 N. 21<sup>st</sup> Street Purcellville, Virginia 20132

Michael Maloy, CPG

Date: October 15, 2007

TRIAD Project # 05-07-0092

### **Table of Contents**

1.0	Introduction						
2.0	Pumping						
3.0	Hydrogeologic Setting	3					
4.0	Groundwater Monitoring  4.1 Background  4.2 Potential Contaminant Sources  4.3 Recommended Groundwater Monitoring Locations  4.4 Installation of Monitoring Equipment  4.5 Monitoring Intervals, Sampling and Reporting  4.6 Sampling Quality Assurance and Quality Control	445					
5.0	Evaluation of the Impact to Groundwater and Surface Water Resources	)					
6.0	Investigation/Mitigation Measures	<b>)</b>					
List of Table 1 Table 2	Proposed Groundwater Monitoring Wells						
List of Figure Figure: Figure: Figure: Figure: Figure:	Site Location Map Estimated Groundwater Flow Direction Map Geologic Mapping Fracture Trace Mapping Compass Rose Proposed Monitoring Wells						
Append Append Append Append Append Append Append	ix A Loudoun County and Virginia Department of Health Correspondence ix B Well Completion Report, Pump Test Data and Engineering Sheet ix C Pump Test Graphics from Saddle Ridge Hydrogeologic Report ix D EDR Report ix E Loudoun County Health Department Well Log Summary						

#### 1.0 INTRODUCTION

TRIAD Engineering, Inc. is pleased to present the following pumping, monitoring and mitigation plan (PMMP) on behalf of our client, the Town of Hamilton. This PMMP has been specifically prepared for Well 14, which is situated on a 1.36 acre parcel just outside of the Town of Hamilton limits (PIN 454-20-8349) and is shown on Figure 1. This PMMP describes the anticipated pumping rates, monitoring methods for the supply well and select off site wells, and includes mitigation strategies to be initiated in the event that any offsite well is deemed to be negatively impacted due to groundwater withdrawal from Well 14. The monitoring section of the plan has been developed to address the groundwater monitoring requirements of Section 6.240, G., I., J., and K. of the Loudoun County Facility Standards Manual (FSM).

Well 14 will withdraw in excess of 10,000 gallons per day and is therefore subject to hydrogeologic study requirements of the Loudoun County Facility Standards Manual (Section 6.240). The Town of Hamilton has requested a waiver of Hydrogeologic Study Requirements and this PMMP has been prepared to address monitoring and mitigation concerns expressed by the Loudoun County Department of Building and Development in correspondence dated September 12, 2007. A similar request was made by the Virginia Department of Health Office of Water Programs in correspondence dated September 18, 2007. Copies of this correspondence have been provided in Appendix A. To satisfy these requests the Town of Hamilton is pleased to submit this PMMP which addresses plans for pumping, monitoring and mitigation for Well 14. With the approval of this PMMP the Town of Hamilton understands that the Hydrogeologic Study Requirements as outlined in FSM Section 6.240 will be waived.

#### 2.0 PUMPING

Well 14, also known as the Stone Eden Well, was completed on October 21, 2000 by Valley Drilling Corporation. The well was completed to a depth of 420 feet where an air lift yield of 400 gallons per minute (gpm) was recorded. The well was constructed with 8-inch diameter casing set to a depth of 126 feet. Water bearing zones were noted from 240 feet to 360 feet. A well completion report for Well 14 has been included as Appendix B. Well 14 underwent 48-hour pump testing on December 10, 2000. The well was pumped for 48 hours with a final recorded pumping rate of 350 gpm. Pump test data sheets have been provided in Appendix B, along with a drawdown and recovery graph. Based on the pump test data, the Virginia Health Department Office of Water Programs (ODW) has determined a safe yield of 280,000 gallons per day from this well as documented on the Department of Health Engineering Sheet included as Appendix B.

Pumping of the well will occur on demand from the existing water treatment facility and will not exceed 280,000 gallons in any single day. The projected demand is estimated to be approximately 120,000 gallons per day with minimal increases from new connections over time. While the Town of Hamilton does not expect to withdrawal the entire safe yield of the well (280,000 gpd) at this time, it does wish to obtain approval to utilize the

full capacity of this well (production at a maximum of 350 gpm for a maximum of 800 minutes per day) as a supply resource for future groundwater withdrawal demand.

The Town of Hamilton operates a public water utility that currently serves approximately 700 customers, who average approximately 164 gallons per day (gpd) per equivalent residential connection (ERC). The addition of the elementary school to the system will result in an anticipated increase in demand of 5,000 gallons per day. Assuming a 5,000 gpd demand for the school, the anticipated typical withdrawal rate is expected to be in the range of 120,000 gpd. Supporting calculations have been provided below.

- The average daily withdrawal is estimated to be 120,000 gallons per day.
- The average monthly withdrawal is estimated to be 3,600,000 gallons per month. Monthly fluctuations would not be expected to exceed 20%, or 720,000 gallons, during any given month of the year.
- The maximum withdrawal for a one day period is 280,000 gallons per day. (Such a withdrawal could occur during an emergency situation involving equipment failure or fire. Also the Town's water storage tanks require internal inspection every three years and require flushing and immediate refilling.)

The anticipated daily withdrawal from Well 14 (120,000 gpd) represents 43% of the determined safe yield for the well and 24% of the 48-hr pump test yield.

#### 3.0 HYDROGEOLOGIC SETTING

To better understand the hydrogeologic setting of the site, TRIAD personnel reviewed available geologic mapping, performed a fracture trace analysis of the site and larger site area, reviewed a hydrogeologic report generated from work on a nearby subdivision and reviewed available well log data from the Loudoun County Health Department. The available well logs obtained from Health Department Files provided useful information with regard to off site well construction including depth of identified water bearing zones. Site reconnaissance was also performed to evaluate landscape positions with respect to neighboring properties and Well 14.

The subject property drains towards the west and storm water enters an unnamed tributary of Crooked Run which is located approximately 250 feet west of the subject site. Another small unnamed tributary drains westward just south of Well 14. An attempt to approximate general groundwater flow direction has been made based solely on landscape position and is shown in Figure 2.

Geologic mapping obtained from the Loudoun County Geologic GIS Office indicates that the site is underlain by the Marshall Metagranite (Ymb). Geologic mapping of the site has been provided as Figure 3. The Marshall Metagranite is a Proterozoic age gneiss and lies within the Blue Ridge Physiographic Province. Descriptions from boring logs obtained form the nearby area suggest the presence of moderately well foliated, quartz feldspar-biotite gneiss. A diabase intrusion is mapped west of the site and is noted to be trending in a north-south direction.

#### 3.1 Fracture Fabric Evaluation

The fracture trace mapping utilized stereoscopic analysis of aerial photographs to identify traces, or lineaments, indicative of zones of fracture concentration. Stereo pairs of aerial photographs were obtained with leaf off conditions at a scale of 1:24,000, dated April 12, 1982 and at a scale of 1:12,000, dated December 30, 1998. The 1982 photography provided coverage of much of the site area prior to significant development. Zones of fracture concentration can often create transmissive conditions which can be important in determining potential impact from high yield wells. The development of this PMMP has taken into account the hydrogeologic implications of the results of the fracture trace analysis. Results of the fracture trace mapping were also compared with mapped lineaments on the adjacent Saddle Ridge Subdivision prepared by others.

Mapped fracture traces or lineaments identified during this study are shown in Figure 4. The orientations of the mapped lineaments were evaluated and orientation measurements were utilized to prepare a compass rose which is depicted as Figure 5. The mapped lineaments were found to have two dominant orientations with the first orientation trending north northeast and a second trending north northwest. A prominent lineament, with a northeast trend was mapped across the central portion of the well lot. A second prominent lineament was also mapped just west of the well lot, which trends in a general north northwest orientation.

### 3.2 Available Hydrogeologic Reports

TRIAD reviewed the Detailed Hydrogeologic Report prepared by others for the Saddle Ridge Subdivision. The report which is dated December 2000 was obtained from the Loudoun County Department of Building and Development. The report included pump testing results generated during the aquifer testing of 19 wells within the Subdivision. The findings of the report suggested that several wells appeared to have experienced interference, or impact, during the completion of Well 14. However, upon review the noted influence appears to be relatively moderate. Five (5) wells that were noted within the report were FRA-28, FRA-30, FRA-2-1, FRA-32 and FRA 5-1. Some of these wells were noted to be sluggish during recovery, and some were noted to have experienced drawdown in the range of 3 to 10 feet. A copy of pump test graphics for these wells has been provided in Appendix C. An artesian well was also noted within the report to have had potential to contribute to well interference. The wells that were identified to have experienced interference were generally located in the northern portion of the Saddle

Ridge Subdivision which lies just south of Route 709. Well 14 is situated approximately 400 feet north of Route 709.

The report provided useful information with regard to observed well yield and general groundwater availability within the site area. Nineteen wells were completed and observed to have air lift yields ranging from 2-75 gallons per minute with an average air lift yield of 29 gpm. No dry wells were reported to have been completed. Of the five wells that were noted to have experienced interference their respective yields were 5, 50, 25, 10 and 50 gpm. Compared to published well yield data for similar bedrock lithology, the air lift yield measurements noted during the completion of wells within the Saddle Ridge Development appear to be above average. The Interpretative Guide to Geology and Groundwater in Loudoun County (Department of Environmental Resources, Loudoun County, Virginia, 1993) indicates that the average groundwater yield for Marshall Formation (gneiss complex) is 16.7 gpm. While offsite conditions may vary, the bedrock geology mapping suggest similar litholgy underlying Well 14 and in the nearby vicinity.

## 4.0 GROUNDWATER MONITORING

#### 4.1 Background

This monitoring plan has been developed to provide meaningful data towards evaluating any potential impact to offsite wells during the planned use of Well 14. Wells for off site monitoring have been selected based on an assessment of the hydrogeologic setting, proximity to Well 14, and well interference data obtained from an adjacent hydrogeologic study. A monitoring regime has been designed with specific monitoring intervals to correspond with relatively stable use. Monitoring data, including both depth-to-water measurements and withdrawal rates from Well 14, will be evaluated to determine baseline conditions and to aid in identifying any potential off site impact. If withdrawal rates are observed to increase sharply above anticipated use, the monitoring intervals will need to be re-evaluated.

## 4.2 Potential Contaminant Sources

To develop an adequate monitoring plan, an assessment of the site and site area was performed to determine the presence of any potential contaminant sources that could impact the site well or perhaps other nearby wells. This assessment was conducted by reviewing data from the Loudoun County GIS Office and by requesting a search of local, State and Federal Regulatory databases by Environmental Data Resources, Inc. (EDR). A map has been prepared with the Loudoun County GIS data which indicates potential contaminant sources within proximity to Well 14. Based on our review of this data, these sources appear to be limited to septic fields. A potential contaminant threat map has been provided as Figure 7. The EDR report did not identify any mapped sites within the EDR defined search radius. A limited number of orphan sites, which do not have adequate address information for accurate mapping were identified, but those sites do not appear to be proximal to the site. The EDR Report is provided as Appendix D.

## 4.3 Recommended Groundwater Monitoring Locations

In selecting wells to be included within the monitoring program, an attempt has been made to identify wells that may be more likely to experience impact, if any, from the withdrawal of groundwater from Well 14. A map was prepared that shows existing wells within a ½ mile radius of Well 14 which is presented in Appendix E. A review of well logs proximal to the site was conducted at the Loudoun County Health Department and 36 well completion reports were obtained and reviewed. A map showing the location of the 36 wells has also been provided in Appendix E, along with a tabular summary of the well data. Wells that are located within a 1000-foot radius of Well 14 were each evaluated based on their location with respect to Well 14 and on the depth and number of their reported water-bearing zones. The most proximal wells to Well 14 that were identified by this investigation lie within the Saddle Ridge Subdivision, with the closest well being approximately 450 feet away.

Thirteen (13) of the wells located within 1000 feet of Well 14 have been selected as proposed monitoring wells. Each of the 13 wells is representative of a single property parcel. The proposed monitoring wells are shown on Figure 6 and available details regarding the well construction and water bearing zones for these wells has been provided in Table 1 below.

While nearby wells are not located in every direction from Well 14, the identified wells together provide good spatial coverage for most of the surrounding area. These selected wells are believed to provide good locations for monitoring data that are expected to be generally representative of the bedrock aquifer conditions underlying the site; however, use of the wells will depend on obtaining permission from landowners to regularly access their wells. Each well owner will be contacted by the client to determine if they wish to have their well monitored.

Table 1
Proposed Monitoring Wells

Well #	Parcel Identification Number	Well Yield (gpm)	Total Depth (feet)	Depth to Bedrock (feet)	Static Water Level (feet)	Water-Bearing Depths (feet)**
1	419253590**	NA	NA	NA	NA	NA
2	419260463	30	200	10	30	134
3	419159786	12	500	10	12	460
4	419157282	50	380	20	30	180 (2), 365 (48)
5	419155183	30	400	10	12	190 (4), 360 (26)
6	419153482	30	275	10	30	253
7	419150980	50	250	8	0	225
8	454108379	20	250	8	30	222
9	454105978	60	383	50	30	381
10	454104178	15	300	50	30	278
11	454102078	25	50	25	25	275
12	454297930	15	380	25	2	365
13	454302227	15	260	51	40	235

Note: NA: Not Available; \* Values are given in feet below the ground surface, numbers in parentheses are estimated flow at each given depth. \*\*: Loudoun County Mapping System indicates that a well is located on this parcel; however, data for this well were not found during review of Health department records.

#### 4.4 Installation of Monitoring Equipment

Existing private residential supply wells will be utilized for monitoring of potential impacts from Well 14. Owners of selected wells will be contacted with requests for permission to use their wells for long-term monitoring. Formal, legal agreements for access to each well will be presented to each owner of the selected wells. A signed agreement from the well owner will be required before including the well into the monitoring program.

Water levels in the wells will be measured and recorded by dedicated automatic pressure transducers (probes). Attempts will be made to a collect manual depth-to-water measurement from each well just before installation of the probe. The downhole equipment will consist of In Situ brand Level Troll Pressure transducers or equivalent, with approximately 100 feet of vented cable. The probes will be suspended from the top of the well casing, or to the well cap. Attempts will be made to install the monitoring equipment so that the well caps will not have to be removed for data collection. However, depending on the well cap construction, the cap may need to be removed temporarily to access the underlying pressure transducer cable connection.

After installation, the well will be shocked with chlorine, as per VDH guidelines for new wells, so as to guard against the potential for any bacterial contamination from the installation of the down well equipment. Coordination with the well owner will be necessary to purge the well adequately after shocking. Data will be retrieved from the data logger electronically through the cable connection, which will be fitted just beneath the well cap. While the well cap may have to be temporarily removed to retrieve data,

no down well equipment will be used following the initial equipment installation. In the event of equipment failure, the probe may have to be retrieved and re-installed which would again require chlorination procedures. We assume that groundwater quality sampling will utilize flow from existing exterior taps.

## 4.5 Monitoring Intervals, Sampling and Reporting

TRIAD Engineering recommends the following monitoring schedule for the 13 proposed monitoring well locations.

- Background monitoring of the well array will be conducted for at least 30 days prior to the start-up of pumping in Well 14. During this period, insitu transducer probes will be utilized to collect water level data at 15-minute intervals within the selected monitoring wells. Each monitor well site will be visited on a weekly basis to download the collected data. These data will be used to aid in establishing "normal" fluctuation in water levels in the monitoring wells.
- The background monitoring will also include an evaluation of water quality. Initially each well will be sampled and analyzed for the "Loudoun County Suite of parameters". This analytical parameter list has been included as Appendix F. Groundwater quality will also be evaluated by field instrumentation for the following parameters: ph, specific conductivity, turbidity and temperature.
- Water level measurements will continue to be monitored at the 15-minute frequency for 30 days after withdrawal from Well 14 begins. Again, the water level data will be downloaded weekly from the monitoring locations. Field instrumentation will be used to evaluate ph, specific conductivity, turbidity, and temperature at approximately 30 days following start up of the pumping of Well 14.

Discharge data from Well 14 will be closely monitored and recorded by Town of Hamilton officials or assigned contractors. The discharge readings will be collected daily for the first 30 days that Well 14 is online.

- Following the first 30 days of well production, a review of the data will be made
  to determine if any significant impacts on water levels can be detected. The
  findings of this review will be provided to the Loudoun County Building and
  Development office. The report will include a general assessment of the
  monitoring program and a quantification and professional assessment of impacts
  to monitoring wells, if any, are observed.
- Following the first 30 days of monitoring, water level measurements will continue
  to be collected from the monitor wells, but will be collected at 6 hours intervals.
  The data will be downloaded on a monthly basis from each monitor well location.
  Field instrumentation will also be used to evaluate ph, specific conductivity,
  turbidity and temperature monthly for the first three months. Following the first

Pumping, Monitoring and Mitigation Plan Well 14 Town of Hamilton

Triad Engineering, Inc. October 15, 2007

quarter the monitoring of field parameters will occur once per quarter. Following the first quarter of monitoring, discharge measurements will be collected from Well 14 on a weekly basis.

- Data obtained during the first quarter of monitoring will be analyzed and documented within a quarterly report which will be prepared for submittal to the Loudoun County Building and Development Office. The report will provide all monitoring data for the first quarter, including water production, as well as a professional assessment of impacts to monitoring well water levels, if any are observed.
- This monitoring program will continue for two years from the time of pumping This monitoring program will continue for two years from the time of pumping startup at Well 14. At the end of the two year monitoring period the Town of Hamilton will submit a final groundwater monitoring report to the Loudon County Building and Development Office. The final report will include all data detailed hydrogeological analysis, as to the nature and extent of apparent impacts / // Ast a if any, to the neighboring residential supply wells. The report will include a recommendation of whether additional monitoring beyond the planned two year interval appears warranted.

The following chart provides a tabulated summary of the proposed monitoring schedule.

Table 2 Monitor Locations, Sampling Parameters with Intervals and Reports

			<del>-</del>
Monitoring Location	Analytical Parameters with Sampling Intervals	Water Level Gauging	Well 14 Discharge Measurements
Selected Monitor Wells:  MW1 (PIN 419253590)  MW2 (PIN 419260463)  MW3 (PIN 419159786)  MW4 (PIN 419157282)  MW5 (PIN 419155183)  MW6 (PIN 419153482)  MW7 (PIN 419150980)  MW8 (PIN 454108379)  MW9 (PIN 454105978)  MW10 (PIN 454104178)  MW11 (PIN 454102078)  MW12 (PIN 454297930)  MW13 (PIN 454302227)	Wells sampled for Loudoun County Parameter Suite (interval – Single background event)  Turbidity, pH, Specific Conductivity, and Temperature with field instrumentation  (interval - background event, then every 30 days for first quarter, then quarterly for 2 years)	Data collection with electronic data loggers  (interval - 15 minute collection intervals during both 30 day background and during first 30 days of Well Operation, then at 6 hour intervals for 2 years)	Discharge measurements recorded manually  (interval - daily collection during background and during first quarter, then weekly thereafter for 2 years)
Quarterly re	menting first 30 days of ports for 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> ive Report documenting	of well operation.  7, 5 <sup>th</sup> , 6 <sup>th</sup> , and 7 <sup>th</sup> quartering 2 years of monitoring	ers

#### 4.6 Sampling Quality Assurance and Quality Control

The groundwater sampling program will follow generally accepted professional methods and standards for field sampling and quality assurance. All sample containers will be prepared by a certified laboratory or equipment vendor. Personnel performing sampling will wear clean Latex gloves at each sample location to prevent any potential cross contamination. All samples collected for laboratory analysis will be transported under chain-of-custody documentation.

# 5.0 EVALUATION OF THE IMPACT TO GROUNDWATER AND SURFACE WATER RESOURCES

This PMMP has involved the review of available geologic mapping, well completion reports, a hydrogeologic report generated for a nearby subdivision, and completion of a fracture trace analysis in order to grasp a better understanding of the hydrogeology of the site. The site is underlain by a crystalline bedrock aquifer that is generally found to be well fractured. Such an aquifer system is capable of supplying relatively high yields of water to groundwater wells. In fact, based on a review of 36 well completion reports during this study, the average reported air lift yield was found to be 26.8 gallons per minute. Of these 36 wells only five were reported to have yields less than 10 gpm.

Aquifer testing performed by others within the nearby Saddle Brook subdivision indicated relatively minimal drawdown in the majority of the tested wells and most were found to recover in a reasonable timeframe.

Based on the bedrock aquifer characteristics noted within this assessment, specifically highly fractured rock supporting relatively high yielding wells, the withdrawal of groundwater from Well 14 is not expected to significantly impact regional groundwater resources. While some impact may occur to proximal wells, it is not expected that the impact will be significant. This PPMP includes a groundwater monitoring plan which will utilize select monitor wells within 1000 feet of the site to monitor for the occurrence of any impact to the wells.

A tributary of Crooked Run lies approximately 250 west of Well 14. This small stream is fed by a considerable drainage area which lies within an upgradient position with respect to Well 14. Groundwater withdrawal is not anticipated to significantly impact this stream and surface water monitoring has not been included within this PMMP.

### 6.0 INVESTIGATION/MITIGATION MEASURES

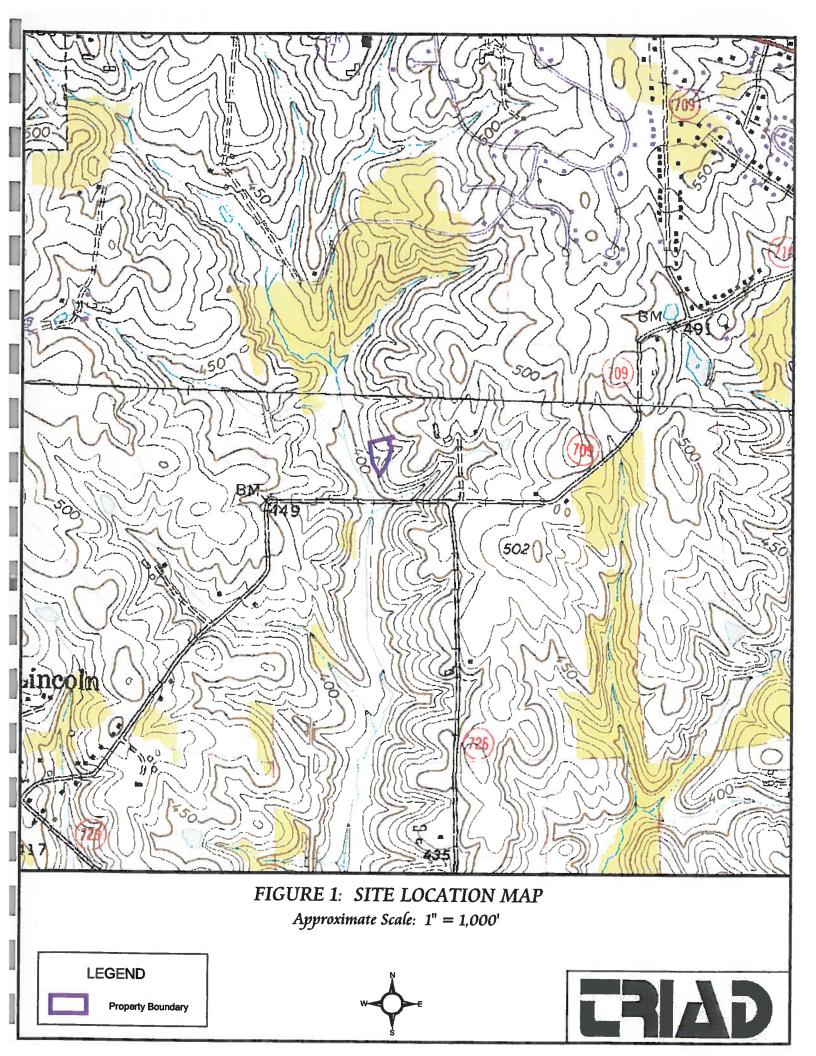
## 6.1 Off-site Well Investigation/Mitigation

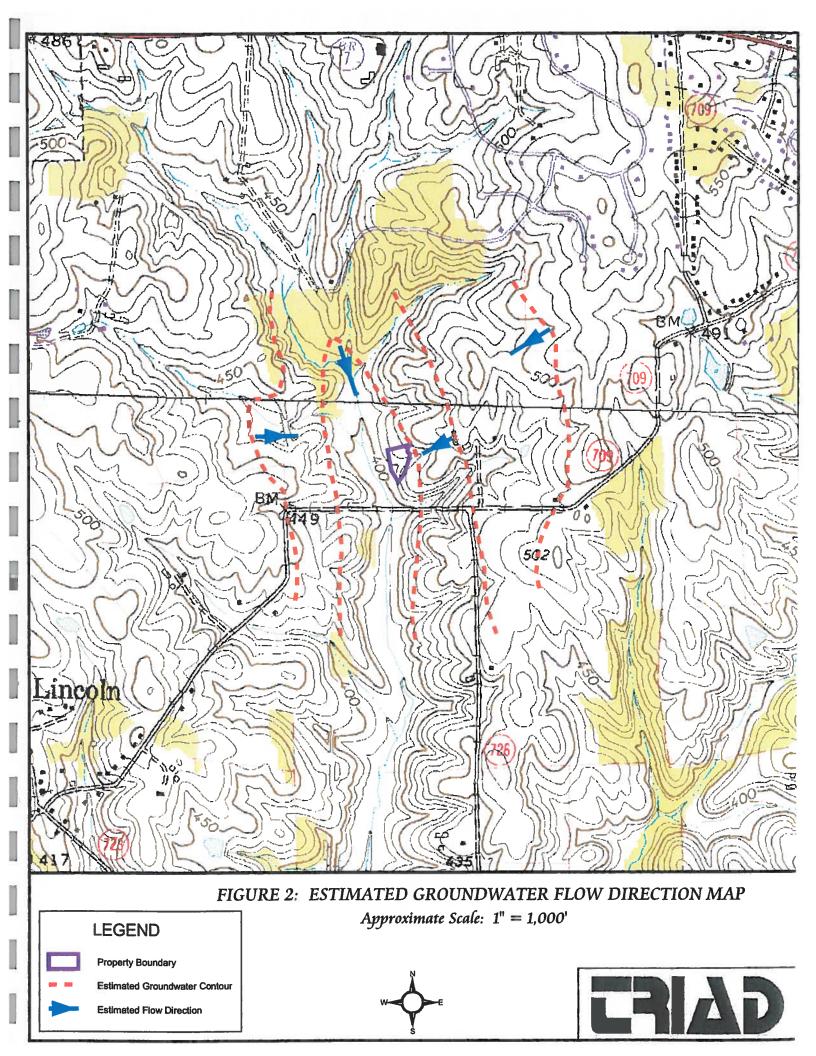
The objective of the monitoring program is to detect significant adverse impacts (i.e., drawdown) to private off-site supply wells in the vicinity of Well 14. Data generated by

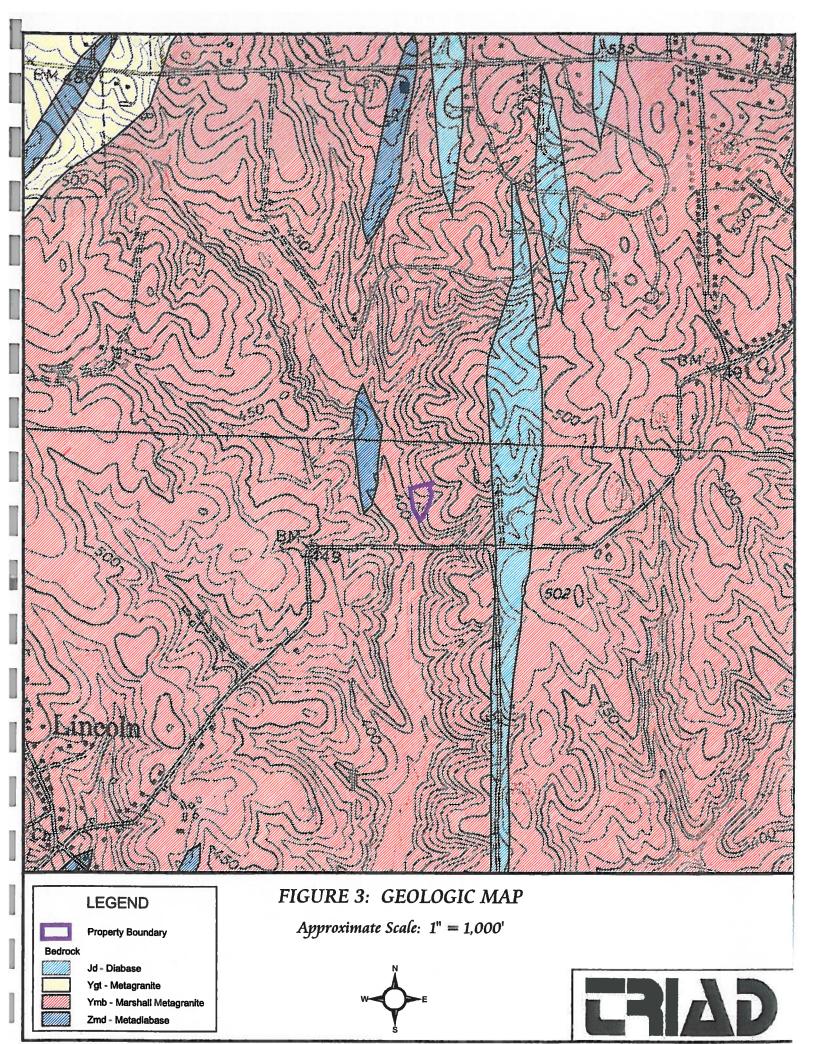
the site's PMMP will be utilized to monitor for any potential offsite impact and to aid in determining the potential source of impact to any off site well. The monitoring program will use background data collected prior to the operation of Well 14 to aid in identifying normal groundwater level fluctuations within the monitor wells. At any time during the monitoring period if a statistically significant change in groundwater levels is observed in the data an attempt will be made to determine if that change appears to be a result of groundwater withdrawal from Well 14. This assessment will be made by the Town of Hamilton's Groundwater Consultant. The Town of Hamilton will notify the Loudon County Building and Development Office upon identifying any such condition. The frequency of water level monitoring on the specific well in question would be increased to 15 minute intervals to enable a better assessment of water level fluctuation in the monitor well and to determine the potential source of impact to the monitor well.

A licensed well and pump installer will be retained by the Town of Hamilton to physically inspect any well that appears to be impacted due to the operation of Well 14. The inspection will consist of an evaluation of the well and pump equipment to determine if it appears to be functioning properly. If the pump submergence is not adequate for normal system operation, the technician will determine if the pump can be lowered and will provide his report to the Town of Hamilton. If deemed possible, lowering of the pump would likely be the first step toward mitigating impact to any well. If lowering of the pump were unsuccessful, well rehabilitation efforts (deepening or reaming of the well) and/or new well installation would be considered. The Town of Hamilton will work diligently to provide water supply to any offsite well that is deemed to have been critically impacted by the usage of Well 14. If necessary repairs to the system are identified that appear to be due to normal wear and usage, and are not deemed to be due to the use of Well 14, the well owner will be provided with the findings and recommendations of the well and pump technician.

Send Reports to citizens notify of poolling & meet. meet routinity **Figures** 







Zmd - Metadiabase

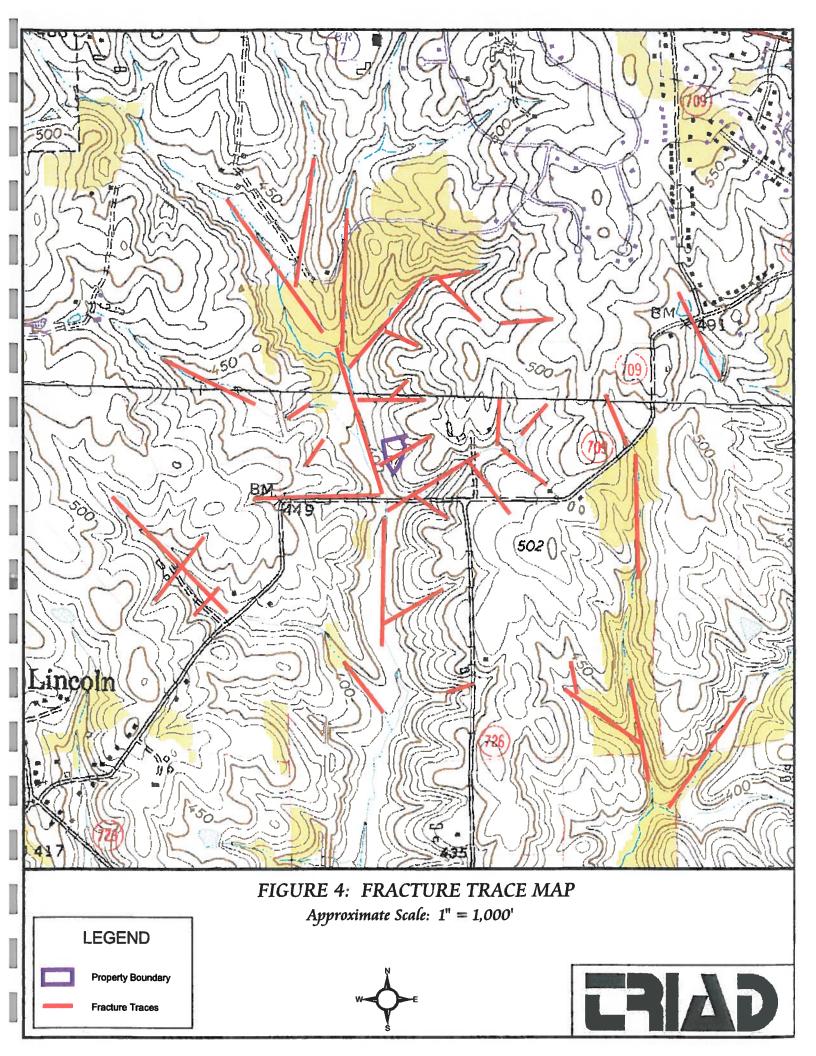
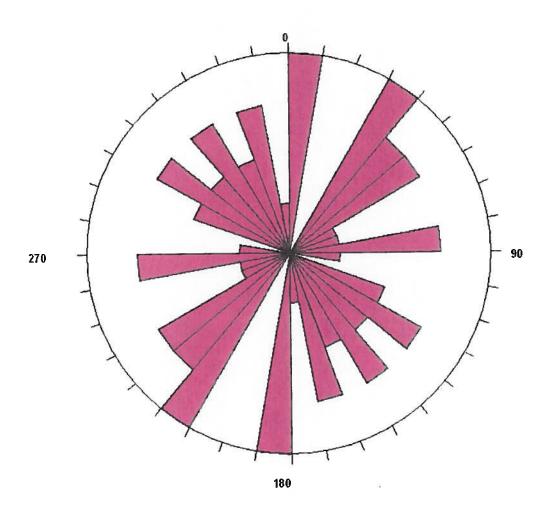
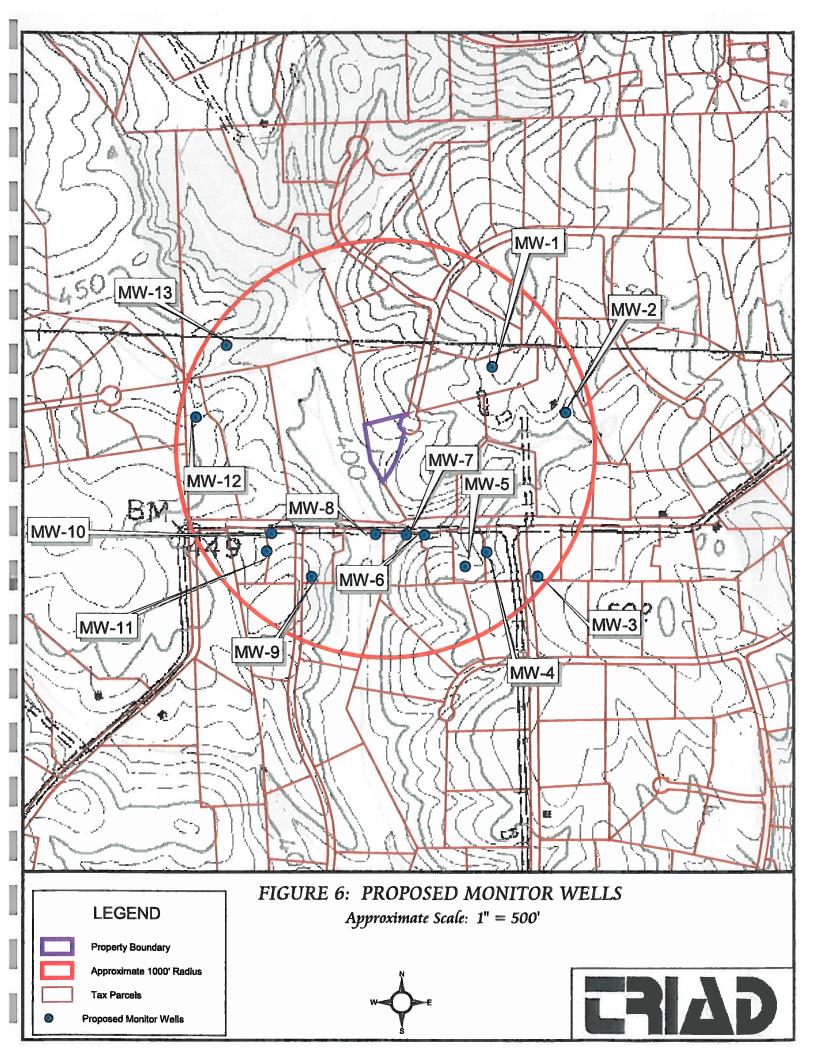
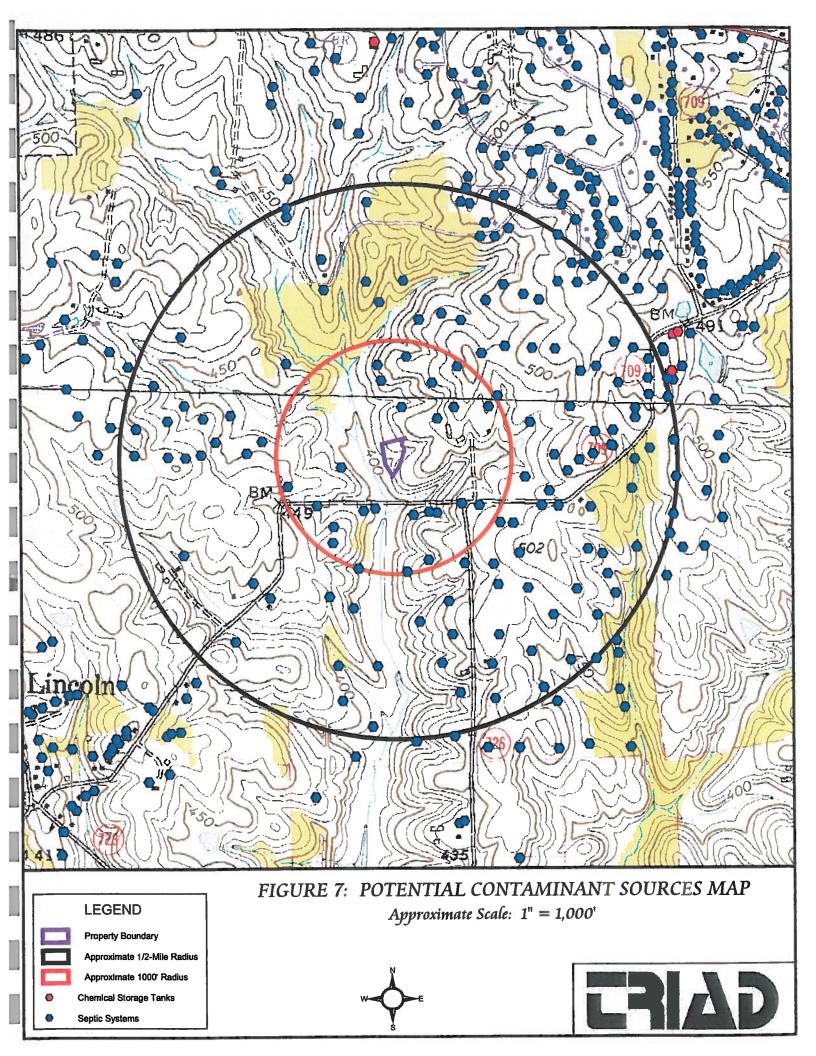


Figure 5: Compass Rose (Based on Mapped Fracture Trace Orientation)







### Appendix A

Loudoun and Virginia Department of Health Correspondence



## Loudoun County, Virginia

Department of Building and Development 1 Harrison Street, S. E., Leesburg, VA 20177-7000 Administration: 703/777-0397 Fax: 703/771-5215

September 12, 2007

Mr. David L. Bowers, P.E. Stantec Consulting Services Inc. 108 Church Street, S.E. Leesburg, VA 20175-3003

Re: WAIV-2007-0111 - Request Waiver of Hydrogeologic Study Requirements for Town of Hamilton Communal Water Supply Well Located at MCPI 454-20-8349
Related Application SPEX 2007-0022 - Town of Hamilton Water Treatment Plant

Dear Mr. Bowers:

This letter is in response to your request (enclosed letter dated August 9, 2007) for a waiver of the hydrogeologic study requirements specified in section 6.240 of the Loudoun County Facilities Standards Manual (FSM). The hydrogeologic study is required for the proposed groundwater withdrawals from a new water supply well (well #14) to supplement existing water wells serving the Town of Hamilton and a planned elementary school.

#### Background

Production well #14 is on a 1.36 acre parcel located slightly less than one mile outside of the Town limits. During drilling and development of this well in November 2000, water level monitoring in several wells on adjacent properties showed impacts due to the water being pumped from well #14. (The wells on the adjacent property were being tested as part of a hydrogeologic study for the proposed Saddle Ridge subdivision. Those wells now serve individual lots of the subdivision as domestic water supplies.) In a meeting in February 2005, County staff informed Town officials that the planned use of well #14 would require submission and approval of a hydrogeologic study (per Loudoun County Facilities Standards Manual Chapter 6.240) since proposed groundwater withdrawals outside of the Town limits would exceed an average of 10,000 gallons per day (gpd) during any single 30 day period. A hydrogeologic study for groundwater withdrawals from well #14 was never submitted to the County. In May 2007, a Special Exception Application (SPEX-2007-0022) was accepted by the County for the associated water treatment system that the Town proposed and staff have recommended that an approved hydrogeologic study be made a special condition of approval.

The County still believes that a hydrogeologic study is the most thorough approach to determine the pumping interference between well #14 and wells on adjacent properties and to develop an effective pumping management, monitoring, and mitigation plan. However, in a meeting at the County Government Center on July 12, 2007, the County agreed that, if a plan for Pumping, Monitoring, and Mitigation (hereafter referred to as a PMM plan) were developed by the Town, submitted to the County for review, and found to be satisfactory and approved, the County would consider waiving the FSM 6.240 hydrogeologic study requirements if requested by the Town.

Mr. David Bowers WAIV-2007-0111 September 12, 2007 Page 2

#### **Comments and Decision**

Provided with your August 9, 2007 waiver request letter was a document that included very limited information on proposed pumping management, monitoring, and mitigation. For the County to consider waiving FSM 6.240, sufficient detail and supporting information must be provided in a comprehensive PMM plan. The current information submitted is inadequate and will have to be significantly enhanced before staff will conduct an official evaluation and consider approval. The PMM plan should include (but not be limited to) information that thoroughly addresses the issues listed in subsections G, I, J, and K of FSM 6.240. To help provide you with additional guidance on what staff will be evaluating in the PMM plan, comments on the previously submitted information are listed in the Attachment to this letter. Please note that the comments in the Attachment are only intended as guidance and that a formal review with comments will not be made by staff until a comprehensive PPM plan is submitted.

The County's intent in consideration of this waiver request is to work with the Town of Hamilton so that they are able to use well #14 to support the water needs of the Town and protect the existing water supplies of adjacent property owners. With the expectation that the Town will submit a PMM plan that is acceptable to the County, your request to waive FSM 6.240 is hereby conditionally approved. This waiver approval will be void if a PMM plan to address groundwater withdrawals from the Town of Hamilton well #14 is not submitted and approved by the County prior to or concurrent with approval of Special Exception application SPEX-2007-0111. Please note that the County will require up to 30 days for initial review and comment on the submitted PMM plan and up to 2 weeks for review and comment on subsequent rounds of submissions, if needed.

If you have any questions, please contact either of the following members of my staff: Kelly Baty at 703-771-5390 / Kelly.Baty@loudoun.gov
Glen Rubis at 703-777-0222 / Glen.Rubis@loudoun.gov

Sincerely.

Terrance Wharton,

TW/gr

**Director** 

Attachment (additional guidance)

cc: FSM Waiver Library

Michael Seigfried, Alex Blackburn, Todd Taylor - Department of Building & Development

Rodion Iwanczuk - Department of Planning

Jeff Widmeyer - Department of Health

Sarah Howard-O'Brien - Loudon County Public Schools

Supervisor James Burton - Loudoun County Board of Supervisors

Bob Edelman - Virginia Department of Health

#### Attachment

# Additional guidance on developing a Pumping Management, Monitoring, and Mitigation Plan for the Town of Hamilton well #14

- Prior to evaluation by the County of the PMM plan, the Town must obtain all permits required by the Virginia Department of Health that may affect groundwater withdrawals from well #14.
- PMM plan shall include (but not be limited to) issues listed in FSM Chapter 6.240 G. (monitoring), I. (pumping plan), J. (analysis/evaluation of impacts), and K (mitigation).
- Per the documentation include with the 8/9/07 waiver request letter Clarify the proposed monitoring plan relative to the phrase in the 3<sup>rd</sup> paragraph on page 2 of the supporting documentation "...on a 30 day cycle for up to 5 wells for a period of 2 years."
- Each well to be monitored in the mitigation zone will need to have water levels monitored and recorded for a period of at least 30 days before pumping from well #14 begins so that baseline water level data are available for comparison purposes.
- Per the documentation include with the 8/9/07 waiver request letter The monitoring procedures explained in the County's Volunteer Well Donation Project (Attachment D referenced in your supporting documentation), were not designed for potable water supply sources. Monitoring of any domestic (potable) supply wells shall account for the need to maintain sanitary conditions of well and water. Any proposed monitoring methodology shall be reviewed by the County Department of Health for comment on sanitation issues.
- If the rate or duration of pumping from well #14 are increased, the Town shall notify the County and the County will evaluate the need for possible increased monitoring (or reinstating monitoring if previously suspended).
- The PMM plan submitted for review shall be accompanied by sufficient supporting information, maps, and analyses necessary for clarity, accuracy, and evaluation.
- The County will evaluate and consider requests by the Town to modify the approved PMM plan after 2 years of monitoring are completed. Such requests may include reduction or suspension of monitoring activities with the understanding that those activities would be reinstated if well #14 pumping rates or durations increased in the future. Requests shall include supporting data and analyses.





SEP 19 2007

# COMMONWEALTH of VIRGINIA

STANTEC LEESBURG

Phone: (540) 829-7340

Fax: (540) 829-7337

www.vdh.virginia.gov

Environmental Engineering Field Office 400 S. Main St. 2<sup>th</sup> Floor Culpeper, VA 22701

Department of Health
Office of Drinking Water

SEP 18 2007

SUBJECT:

Loudoun County

Water -

Town of Hamilton

Mr. David Bowers, P.E. Stantec Consulting Services Inc. 108 Church Street South East Leesburg, VA 220175-3003

We have received the Pumping, Monitoring and Mitigation Plan (PMMP) dated August 9, 2007 for the Town of Hamilton's proposed Well #14. This Plan was prepared in response to Loudoun County's requirement for a hydrogeologic study as part of a Special Exception application.

According to data available to VDH ODW, a hydrogeologic study on the Town of Hamilton's Well #14 was never completed. The available testing includes a pump and drawdown test conducted during December 2000. We don't know if operation of Well #14 will cause an adverse impact or interference on any nearby wells.

VDH ODW believe that having an ongoing Pumping Management, Monitoring and Mitigation Program (PMMP), including a plan for addressing mitigation of potential interference is desirable considering the value of a high-yielding well such as Well #14. VDH ODW envisions the PMMP to include what amounts to a long-term pumping test, including ongoing water level monitoring and reporting at the production well and selected private wells (monitoring wells). The PMMP could be a useful tool to protect both the interests of the Town and nearby private well owners. While conducting a new hydrogeologic study on Well #14 and the impacts on surrounding private wells is the most desirable option, an ongoing PMMP could be a reasonable compromise.

In general, we find the submitted PMMP lacks many important details and will need to be fleshed out further in order to be a useful tool to the Town. Some suggested items that should be addressed include but are not limited to:

- Scope and objectives of the Plan.
- Scope of the mitigation area.
- Activities and associated schedules, including frequency of data collection and reporting.
- Monitoring protocols and equipment.
- Data review and analysis activities.



Mr. David Bowers, P.E. Page 2 of 2

.

SUBJECT: Water -

Loudoun County Town of Hamilton

- Validation and Mitigation of interferences.
- Dispute resolution.

The PMMP includes a subdivision map and a list of wells and excerpts from the Saddle Ridge Hydrogeologic study by Emery & Garrett Groundwater, Inc.; however these items don't provide enough information to make significant conclusions about the nearby private wells. Among other things, the private wells would need to be located on the map, and other data for the private well identified, including, but not limited to ground elevations, elevations of static water level, pump elevations, final well yields, well pumping rates, etc. We suggest that either as part of the revised PMMP or part of the PMMP activities that needed additional information be collected in order to target private wells most likely to be impacted.

The following comments directly impact the operation and design capacity that may be reflected in an operating permit to cover Well #14:

- 1. Note that the proposed pumping schedule allows only for 8 hours (480 minutes) per day of well operation, whereas the *Waterworks Regulations* effectively allow 800 minutes per day. If adopted as written, this would reduce the design capacity of the well to 350 gpm x 480 minutes/day = 168,000 gpd.
- 2. The proposed pumping plan contemplates using Well #14 only between 9:00 pm and 5:00 am. Note that in an emergency (low water level in storage) the water system wells would automatically operate, regardless of the time. Does the Town plan to exclude use of Well #14 during the daytime?

As stated previously, revised plans and specifications for the Well #14 project, including, but not limited to the well (and associated appurtenances), raw water lines, treatment system, storage, and finished water lines must be submitted to this office for review and approval. Construction of this project shall not begin until a construction permit is issued.

Please feel free to contact me if you have questions or need assistance regarding this matter.

Sincerely,

Robert D. Edelman, P.E. District Engineer

Robert Edelman\_

RDE/tib

CC: Mr. Ray Whitbey, Mayor, Town of Hamilton

Mr. Glen Rubis, Loudoun County Building & Development Department

Loudoun County Health Department

ODW - Central

R. Dist 98 LOUDOUN COUNTY Hamilton. Town of 2007 Well 14 PMMP 9-07 doc

## Appendix B

Well Completion Report, Pump Test Data and Engineering Sheet

Well Log

\* Screen size and mesh for each rose (where applicable)

Type

Type

TYPE

Typs

ft.

ft.

to 100 ft., Type CENERY.

ft., Type HONE

to

to

to

to

ft.

ft.

ft.

ft.

inches from

inches from

inches from

Jaches from

to

to

to

# Kesh size

\* Mesh size

# Kesh siza

\* Mesh size

\* Gravel Pack # From

# Grant

# From

\$ From 0

# Fzon

# CONNOWNEALTH OF VIRGINIA WATER WELL COMPLETION REPORT

State Water Control Board BHCH Ho. (Certification of Completion/County Permit) P. O. Box 11149 2111 Worth Hamilton St. SUCB Permit Richmond, VA 23230 County Permit Certification of imspecting official County/City LOWDOWN / This well does \_\_\_\_ does not \_ County/City Staup meet code/law requirements. 5 E Virginia Plane Coordinates ! Date \_ N \* Owner TOWN OF HAMILTON For office use E \* Well Designation or Humber 95722 Latitude & Longitude Address P.O. BOX 130 HARILTON, VA 20159-Tax Map I.D. No. Phone (540)338-7793 Subdivision \* Topo Hap No. Section \* Elevation I s Drilling Contractor WALLEY DRILLING CORP. VA ft. Riock # Formation Address 9172 JOHN'S. MOSBY MAY, Lot # Lithology UPPERVILLE, VA 20184 Class Well FIIR 2 River Basie Phone . (800)582-9355 # Province \* Type Lags DRILLERS WELL LOCATION FEET direction of TOUR OF HAMELTON & STONE EDEN FARK. 2 Cuttings FEET direction of # Water Apalysis (If possible please include map showing location marked) \* Aquifer Test Date started 10/20/00 # Date completed 16/21/05 Type rig ROTARY.RIS 1 1. WELL DATA: MEU 2. WATER DATA : Water Temperature S6 \* Total depth 420 ft. \* Static water level (unpumped level measured) 17 \* Depth to bedrock 15 ft ft. \* Stabilized measured pumping mater level # Hole size (Also include resked zones) ft \* Stabilized yield 400 gpm after 3 \* 12 bours inches from 0 to 123 ft. Kalural Flow 20 flow rate 1 8 inches from 123 903 to 420. ft. Consent on quality CLEAR isches fras to ft. S. WATER ZONES: From 240 To 360 \* Casing size (I.D.) and material From To luches from Le From To From 4 6 In to 126 ft. Fran to Reterial STEEL 4. USE DATA: Wt. per foot 19.25 or wall thickness .322 in. Type of use: APINISTIC: duches from to Hatorial NOME Wt. per foot or wall thickness in. inches from to Material Mone Wt. par foot or wall thickness

#### Type of facility: purity water

5. PHIP DATA: Type	# Rated HP
* Intake depth	* Capacity at
6. WELLMEAD: Type No. Pressure tenk	il seel WATERTIGHT CAP
_	A Massamaniah and
	A UNTRALABBLE bolt WO
	Pressure relief valve NO
Gete valve Mo	Check valve (when required) NO
Electrical disco	
7 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	senact smitch or bone, anbbin 40
7. DISIMPECTION	Well disinfected No
	Disinfectant used
Anoust	Hours used
B. ABANDONNERT (where Cating pulled Not	applicable) = MO Applicable
Plugging grout fr	to sat

SUCH No.

9. State law requires submitting to the Virginia State Water Control Sourd information about groundwater and walls for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well in completed, on standby, or abandoned. Information required includes: so accurately and completely prepared water well completion report, full data from any equifer pumping tests, drill cuttings taken at tea foot intervals, (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some completion report for public supply wells.

10.0	RILLERS	LOG (Use additional sheets if necessary)		11.	12. DIGGRAN OF HELL
DEPTH From	(feet)	Color, material, fossils, bardoess, etc.	(vater, caving, cavities, broken, core, shot, etc.)	Drilling Time (Nin.)	COUSTRUCTION (with dimensions)
240	360	HATER GEARING:	400 GPK-4 360°		

13. Well lot dedicated Distance to meares Distance to meares 14. WATER SERVICE PIPE Pipe mize lu lestabler	t poliutant source t property line	ft. Well House? ft., Type NOME ft., Building p.s.i. for	ft. Binutes
for well constructi city ordinances and	on as specified in comp the laws and rules of	ructed it accordance liance with appropria the Commonwealth of v	And the second s
Signature Yuan	To Sechritor authorized person)		Date 10-24-00
V		License No. 4	
		Class A-27	105 027957A

Pump Test Data

# VALLEY DRIL. ING CORPORATION OF VIRGINIA

9172 JOHN S. MOSBY HIGHWAY UPPERVILLE, VIRGINIA 20184

UPPERVILLE 540/592-3239 TOLL FREE 1-800/582-9355 FAX 540/592-3259

DATE <u>Sunday 12/10/00</u>

# WELL TEST PUMPING DATA - YIELD & DRAWDOWN, RECOVERY

LOCATION Stone Eden Farm - New Well	WELL DATA:
OWNER Town of Hamilton	DEPTH 420'
PWSID # 6107150	CASING 126'
TEST PUMP 6ICXA 50 HP	YIELD GPM @
TECT DIDATION 48 Hours RECOVERY X	DIAMETER 8"
SAMPLING: CHEMICAL X BACTERIOLOGICAL X	TYPE OF TEST Yield & Drawdown
OTATIO WATER I EVEL 105'	TEST PUMP INTAKE SET @ _ 258'
METER READING BEFORE 1723200 AFTER	AIR LINEELECTRODEX

DATE	TIME	MINUTES	GPM	PWL	месн	TEST DATA COMMENTS
12/10/00	12:00 AM				DS & SS	Disinfected Well
	12:01 PM	1	300	53.0'	DS & SS	
	12:02 PM	2	300	55.7	DS & SS	and the second
	12:03 PM	3	300	56.8'	DS & SS	
	12:04 PM	4	300	57.4	DS & SS	
	12:05 PM	5	300	58.0'	DS & SS	
	12:06 PM	6	300	58.7	DS & SS	
	12:07 PM	7	300	58.8'	DS & SS	
	12:08 PM	8	300	58.9'	DS & SS	
	12:09 PM	9	300	59.0'	DS & SS	
	12:10 PM	10	300	59.0'	DS & SS	
	12:12 PM	12	300	60.2'	DS & SS	
8)	12:14 PM	14	300	- 60.8*	DS & SS	
	12:16 PM	16	300	61.3*	DS & SS	
	12:18 PM	18	300	62.1'	DS & SS	

# VALLEY DRIL\_ING CORPORATIO OF VIRGINIA

DATE_	Sunday	12/10/00
	GE	

# WELL TEST PUMPING DATA - YIELD & DRAWDOWN, RECOVERY

LOCATION Stone Eden Farm - New Well

DATE	TIME	MINUTES	GPM	PWL	месн	TEST DATA COMMENTS
12/10/00	12:20 PM	20	300	62,5	DS & SS	
	12:25 PM	25	300	64.2'	DS & SS	6
	12:30 PM	30	300	65.0	DS & SS	
	12:45 PM	45	300	68.2	DS & SS	80
	1:00 PM	60	300	70.41	DS & SS	
	1:15 PM	75	300	73.2	DS & SS	
	1:30 PM	90	300	75,0°	DS & SS	
	2:00 PM	120	300	77.5	DS & SS	
8.	2:30 PM	150	300	78.9	DS & SS	
	3:00 PM	180	300	80.63	DS & SS	
	4:00 PM	240	300	82.0'	DS & SS	
	5:00 PM	300	300	84,4'	DS & SS	-
	6:00 PM	360	300	86.0°	DS & SS	
	7:00 PM	420	300	87.0	DS & SS	
	8:00 PM	480	300	88.21	DS & SS	
	9:00 PM	540	300	88.6'	DS & SS	
	10:00 PM	600	300	89.0'	DS & SS	
	11:00 PM	660	300	89.01	DS & SS	
	12:00 PM	720	300	90.0'	DS & SS	
12/11/00	1:00 AM	780	300	90.6'	DS & SS	
	2:00 AM	840	300	91,0	DS & SS	

# VALLEY DRILLING CORPORATIOI OF VIRGINIA

DATE	Mond	lay 12/11/00	)
_	GE_	_	-

# WELL TEST PUMPING DATA - YIELD & DRAWDOWN, RECOVERY

LOCATIO	N Stone Eden Farm - New Weli
OWNER	Town of Hamilton.

DATE	TIME	MINUTES	GPM	PWL	MECH	TEST DATA COMMENTS
12/11/00	3:00 AM	900	300	91.01	DS & SS	
	4:00 AM	960	300	91.0'	DS & SS	1
	5:00 AM	1020	300	. 91.0'	DS & SS	
	6:00 AM	1080	300	91.01	DS & SS	
	7:00 AM	1140	300	92.2'	DS & SS	8
	MA 00:8	1200	300	93.31	DS & SS	8:30 AM - INCREASED TO 350 GPM
ii	9:00 AM	1260	350	108.8*	DS & SS	
	10:00 AM	1320	350	109.8	DS & SS	30
	MA 00;11	1380	350	110.2	DS & SS	
	12:00 AM	1440	350	110.8	DS & SS	i e
	1:00 PM	1500	350	111.3'	DS & SS	
	2:00 PM	1560	350	112.0'	DS & SS	
	3:00 PM	1620	350	114.0'	DS & SS	
	4:00 PM	1680	350	114.0'	DS & SS	
	5:00 PM	1740	350	350 114.0' DS & SS		
	6:00 PM	1800	350	114.0	DS & SS	
	7:00 PM	1860	350	114.0'	DS & SS	
	8:00 PM	8:00 PM 1920 350 114.0' DS & SS	5			
	9:00 PM	1980	350	114.0'	DS & SS	
	10:00 PM	2040	350	114.0	DS & SS	
E	11:00 PM	2100	350	114.0'	DS & SS	

# VALLEY DRIL' ING CORPORATION OF VINGINIA

DATE	Monday	12/11/00
	GE	

# WELL TEST PUMPING DATA - YIELD & DRAWDOWN, RECOVERY

LOCATION Stone Eden Farm - New Well

DATE	TIME	MINUTES	GPM	PWL	MECH	TEST DATA COMMENTS
12/11/00	12:00 PM	2160	350	}14.0'	DS & SS	
12/12/00	1:00 AM	2220	350	116.8'	DS & SS	
	2:00 AM	2280	350	116.8'	DS & SS	
	3:00 AM	2340	350	117.8'	DS & SS	
	4:00 AM	2400	350	117.8'	DS & SS	
	5:00 AM	2460	350	117.8'	DS & SS	l
	6:00 AM	2520	350	ā 117.8°	DS & SS	
	7:00 AM	2.580	350	117.8'	DS & SS	
	8:00 AM	2640	350	117.1	DS & SS	
	MA 00:9	2700	350	118.2'	DS & SS	
	10:00 AM	2760	350	118.6	DS & SS	
	11:00 AM	2820	350	118.6'	DS & SS	
	12:00 AM	2880	350	118.6'	DS & SS	Shut off pump - begin recovery
	*		111 41		W 2	
12/12/00	12:01 PM	1		118.6'	DS & SS	181
	12:02 PM	2		110.0	DS & SS	
	1.2:03 PM	3		101.0	DS & SS	
	12:04 PM	4		90.0'	DS & SS	
	12:05 PM	5		92.0'	DS & SS	
	12:07 PM	7	7	70.01	DS & SS	
	12:09 PM	9	)	65.0	DS & SS	_

# VALLEY DRIL ING CORPORATIO\* OF VIRGINIA

DATE_	Monday	12/1	1/00	
PA	GE	5		

# WELL TEST PUMPING DATA - YIELD & DRAWDOWN, RECOVERY

LOCATION Stone Eden Farm - New Well

DATE	TIME	MINUTES	GPM	PWL	MECH	TEST DATA COMMENTS
12/12/00	12:11 PM	11		61.0'	DS & SS	
	12:13 PM	13		57.0	DS & SS	
	12:15 PM	15		53.0'	DS & SS	
	12:20 PM	20		51.41	DS & SS	
	12:25 PM	25	- 1	50.6'	DS & SS	
	12:30 PM	30		49.9'	DS & SS	٠.
	12:45 PM	45		45.3	DS & SS	
*	1:00 PM	60		44.4	DS & SS	
	1:30 PM	90		42.8'	DS & SS	
	2:00 PM	120		40.4	DS & SS	
	2:30 PM	150		37.8	DS & SS	М
	3:00 PM	180		35.2	DS & SS	
	3:30 PM	210		35.2	DS & SS	<u> </u>
	4;00 PM	240		35.2'	DS & SS	
	5:00 PM	300		35.2'	DS & SS	
				4		
			+			

Well 14 Water Level Depths - Pump test

**Engineering Sheet** 

#### VIRGINIA DEPARTMENT OF HEALTH **ENGINEERING DESCRIPTION SHEET**

DATE:

March 31, 2004

WATERWORKS NAME:

Town of Hamilton

**CERTIFIED CLASS:** 

ſV

COUNTY/CITY:

**Loudoun County** 

LOCATION:

Hamilton is located on Business Route 7; the Stone Eden well is located at the end of Stone Eden Drive, and the filter building is located off Bates Drive, both on the southwest

side of town.

OWNER:

Keith Reasoner, Mayor

Town of Hamilton

53 East Colonial Highway Hamilton, VA 20159 Tele. No. (540) 338-2811

OPERATOR:

Harold Lemarr

Town of Hamilton

53 East Colonial Highway Hamilton, VA 20159 Tele. No. (540) 338-2811

PERMIT NUMBER:

601304

DATE ISSUED:

March 31, 2004

TYPE OF TREATMENT:

Greensand filtration and disinfection

SOURCE:

Stone Eden Well (Well #14) and Wells 6 and 8

**DESIGN CAPACITY:** 

Increase of 331,200 gpd

#### **DESCRIPTION OF SYSTEM:**

The purpose of this project is to add a well, replace an existing treatment system for Wells 6 and 8 and increase the finished water storage capacity of the Town's water system.

Stone Eden Well (Well #14)

The well is located about 240 feet southwest of the end of Stone Eden Drive.

Town of Hamilton Stone Eden Well Page 2 of 5 Virginia Department of Health Engineering Description Sheet

It was drilled in October of 2000. It is 420 feet deep with 8-inch steel casing to 126 feet and cement grout to 100 feet. A 48-hour pump test in December 2000 established the safe yield of the well at 350 gpm with a drawdown of 66 feet (static water level was 53 feet and drawdown level was 119 feet). The well will be equipped with 4 - inch ASTM A53 Grade B steel drop pipe, pitless adapter, lockable and screened watertight well cap, pressure transducer for water level measurement, 7-foot by 7-foot by 6-inch concrete pad around the well head, a check valve at the top of the drop pipe and a submersible pump with a 40 hp motor set with intake at 341.5 feet depth. The pump can deliver 350 gpm at 279 feet of TDH.

A water meter vault located adjacent to the well includes a 4-inch horizontal turbine meter, a discharge pressure gauge, an air release valve and a sample tap. The water meter vault is equipped with a light and a screened floor drain. A 6-inch screened blowoff and valve is located on the well discharge line, after the meter vault.

Approximately 3,200 feet of 6-inch DI pipe will connect the well to a new filtration building to be located on a Town owned parcel between Stone Eden Drive and Bates Drive.

Stone Eden Water Treatment System

The water treatment system consists of a 50,000 gallon bolted steel raw water storage tank (20-feet in diameter, 24-feet in height), a 200,000-gallon bolted steel ground level finished water storage tank (31 feet in diameter and 38 feet in height), a 16,000-gallon underground filter backwash equalization tank (12 feet in diameter, and 20 feet in depth), a filtration building (approximately 63 feet long, 36 feet wide and 16 feet interior clearance), a 400 gpm greensand filtration system and associated pumps and appurtenances. The raw water tank and the finished water tank are of bolted steel construction. The filter backwash equalization tank is of pre-cast concrete construction.

The greensand filtration system consists of two 400-gpm filter feed pumps, two vertical pressure filters, chemical addition systems for addition of sodium hypochlorite and sodium permanganate, three 500-gpm finished water booster pumps, and two 80-gpm backwash equalization pumps. A radio telemetry system is provided to control the operation of Wells 6, 8 and 14 as well as the treatment system.

**Process Description** 

Ground water is pumped from Well 14 via the 350 gpm submersible well pump to the 50,000 gallon raw water storage tank. Wells 6 and 8 also deliver raw water to the raw water storage tank. From the raw water storage tank, the filter feed pumps pump the water at 400 gpm through the greensand filtration system into the 200,000 gallon finished water storage tank, located at ground level. Sodium hypochlorite and sodium permanganate are added continuously to the raw water upstream of the greensand filtration unit for oxidation and removal of iron and manganese.

The finished water is injected with chlorine following filtration and transferred to the finished water storage tank. System feed pumps, transfer finished water from the ground storage tank to the existing 75,000 gallon elevated water storage tank and into the Town of Hamilton's water supply system at 500 gpm.

Greensand filters are backwashed using finished water from the elevated tank. The used backwash water is collected in an underground backwash equalization tank with a capacity of 16,000 gallons. Duplex 80 gpm submersible pumps will transfer backwash water from the equalization tank to the Town of Hamilton's sanitary sewage collection system for disposal.

#### **Greensand Filtration System**

The greensand filtration system consists of two vertical filtration vessels, 9'-6" in diameter and 72 inches minimum sideshell height. The filters have a design surface loading of 2.82 gpm/sf and a surface area of 70.88 square feet. The filter media consists of 18 inches of manganese greensand capped with a 12 inch layer of anthracite. The manganese greensand has an effective size of 0.30 to 0.35 mm with a uniformity coefficient less than 1.60. The anthracite cap has an effective size of 0.60 to 0.80 mm and a uniformity coefficient less than 1.85. A 12-inch thick layer of support gravel is covered by a 3-inch layer of 0.2 - 1.2 mm torpedo sand.

An airwash blower delivering 213 scfm at 5 psig is provided for use during simultaneous air/water backwash. Water is applied during this backwash stage at 3 gpm/sf (213 gpm) for 10 minutes. A water only slow wash operates at 5 gpm/sf (354 gpm) for two minutes. A fast water wash operates at 15 gpm/sf (1,063 gpm) for three minutes.

#### Chemical Addition Systems

Positive-displacement solenoid driven diaphragm chemical metering pumps will deliver chemicals, from the original containers as received from the chemical vendor, through flexible tubing to appropriate locations within the treatment system. One additional warehouse spare pump of each size will be provided. The following table summarizes the chemical addition systems.

Chemical	Addition Point	Pumping Capacity
	A fter raw water feed nump	0.13 gal/hr @ 300 psi
Sodium hypochlorite Sodium permanganate	After sodium hypochlorite	0.13 gal/hr @ 300 psi
Sodium permanganate	addition	0.000
Spare pump	Not installed	0.13 gal/hr @ 300 psi
Sodium hypochlorite	After greensand filters, prior to	0.45 gal/hr @ 300 psi
	finished water storage tank	0.45 gal/hr @ 300 psi
Spare pump	Not installed	0.43 gabin (a) 300 po.

# **Automatic Control System**

An automatic control and telemetry system will control the operation of wells 6, 8, and 14 as well as the ground water treatment system.

#### Town of Hamilton Stone Eden Well Page 4 of 5

#### Virginia Department of Health Engineering Description Sheet

The liquid level in Well 14 will be sensed by a submersible level transducer, mounted approximately 400 feet below the top of the well.

The well pumps at wells 6, 8 and 14 will be automatically operated based on the level of the Raw Water Storage Tank. When the Hand-Off-Auto (HOA) switch for the well pumps are in the Auto position, the well pump will operate when the level in the raw water tank drops to a predetermined level (initial set point is 12 feet). The well pumps will operate until the tank is filled (initial set point 22.5 feet).

The level in the 200,000 gallon finished water storage tank governs the automatic operation of the filter feed pumps and the filters. When the HOA switches for the filter feed pumps are in the auto position and the telemetry system is in the "telemetry" position, one of the filter feed pumps and the filters is energized when the level in the finished water tank drops to a predetermined level and shall operate until the tank is filled. Upon initiating backwash cycle and a "Major Filter System Alarm", the filter feed pumps is stopped. The filter feed pumps shall be de-energized upon reaching "high tank alarm". The filter feed pumps are de-energized upon reaching a "low tank alarm" in the raw water tank.

The level in the existing elevated 75,000 gallon storage tank (remotely located from the treatment system) governs the operation of the system feed pumps. When the HOA switches for the system feed pumps are in the Auto position, the lead pump shall be energized when the level in the elevated water tanks drops to a predetermined level. Should the level in the tank continue to drop to a lower predetermined level, a second system feed pump shall be energized. The pumps will operate until the tank is filled. The controls also include set points for "low tank alarm" and "high tank alarm" for the elevated storage tank. The system feed pumps will be de-energized upon "high tank alarm" for the elevated storage tank.

#### **Design Capacity**

#### Wells:

Well#	Yield (gpm)	Yield (gpd)	Pumping Capacity (gpm)	Pumping Capacity (gpd)	Limiting Capacity (gpd)
14 (New)	350	350 gpm x 2 ERC/gpm x 400 gpd/ERC = 280,000	350 gpm	350 gpm x 1,440 min/day = 504,000	280,000
6 (Existing)	60 gpm	48,000	42	60,480	48,000
8 (Existing)	35	28,000	22	31,680	28,000
Total	445	356,000	414	596,160	356,000

Town of Hamilton Stone Eden Well Page 5 of 5

# Virginia Department of Health Engineering Description Sheet

Thus total wells 6, 8 and 14 limiting capacity is 356,000 gpd based on the above calculations.

The treatment capacity is:

Based on filter surface loading rate: 2.82 gpm/sf x 70.88 sf/vessel x 2 vessels = 400 gpm

Based on hydraulic capacity: 400 gpm x 1,440 min/day = 576,000 gpd

Booster pump capacity:

Booster pumps deliver to an elevated storage tank and consist of three 500 gpm units. Capacity is determined with the largest pump out of service (the "firm" pump capacity). 2 pumps x 500 gpm/pump x 1,440 min/day = 1,440,000 gpd

Storage capacity:

A 200,000 gallon finished water ground storage tank is provided. Therefore, the storage capacity is 200,000 gallons x 1 ERC/200 gallons = 1,000 ERC  $\times$  400 gpd/ERC = 400,000 gpd.

**Design Capacity** 

Based on the calculations above, the design capacity of this project is limited to the total yield of Wells 6, 8 and 14 or 356,000 gpd. Discounting for Wells 6 and 8, Well 14 will increase the Town's waterworks capacity by 280,000 gpd. Wells 6 and 8 contribute 76,000 gpd to the total capacity of this project. The same wells contribute 51,200 gpd to the existing capacity of the Town of Hamilton waterworks. The additional capacity (76,000 - 51,200 = 24,800 gpd) realized from these wells in this project is due to a relaxation in the pumping capacity calculation for a well, which the Department has adopted recently. Thus, this project would increase the Town's permit capacity by 331,200 gpd.

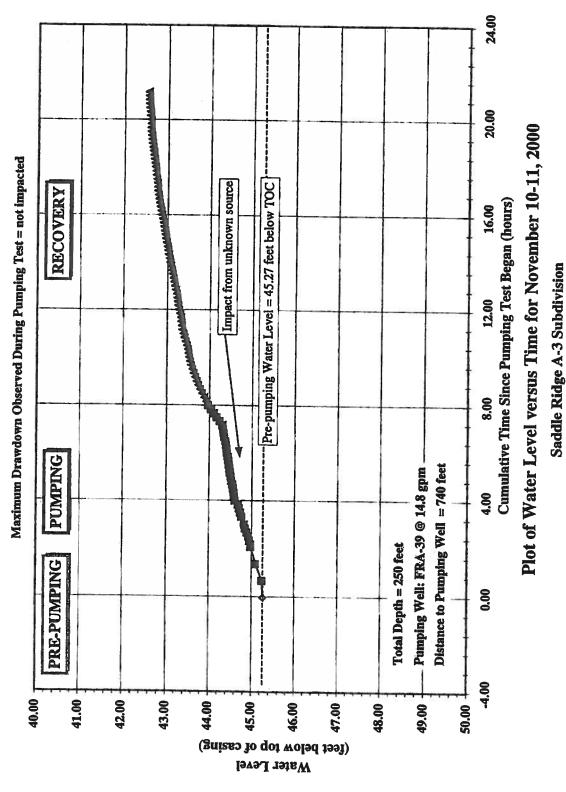
RDE/tjb

S:\Dist 08\Loudoun\Hamilton, Town of\Stone Eden Well.doc

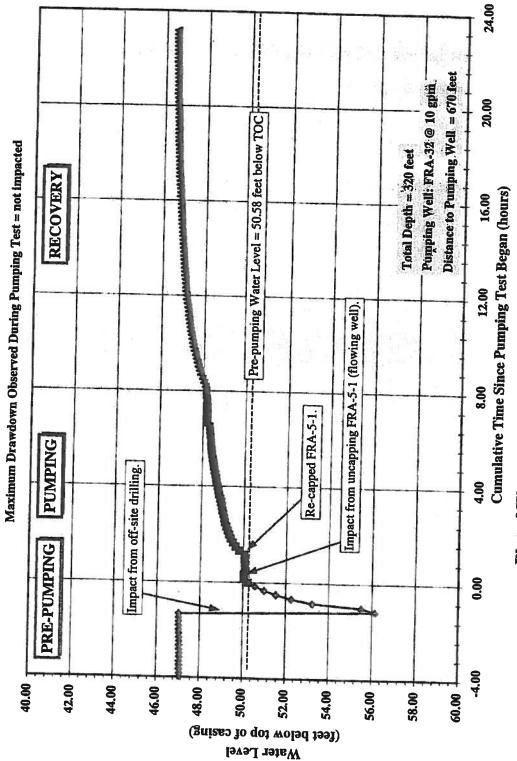
# Appendix C

Pump Test Graphics from Saddle Ridge Report

Loudoun County, Virginia

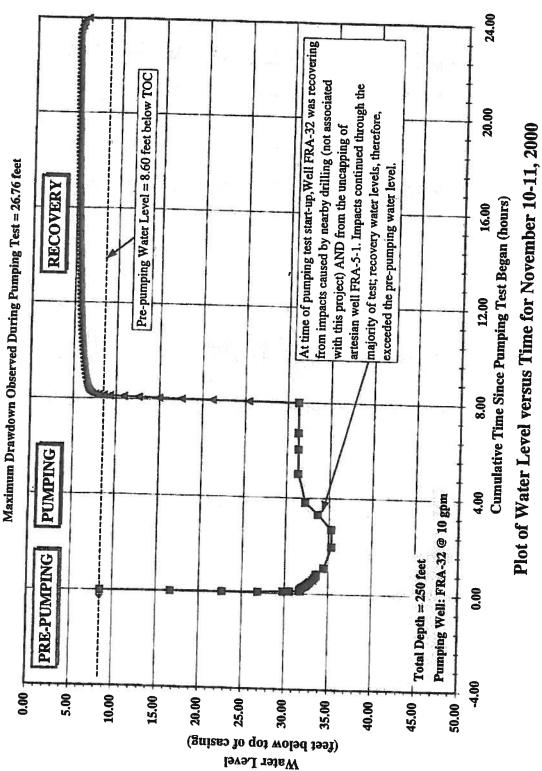


FRA-39-18 mw.xls



Plot of Water Level versus Time for November 10-11, 2000 Saddle Ridge A-3 Subdivision Loudoun County, Virginia

# FRA-32 Pumping Well

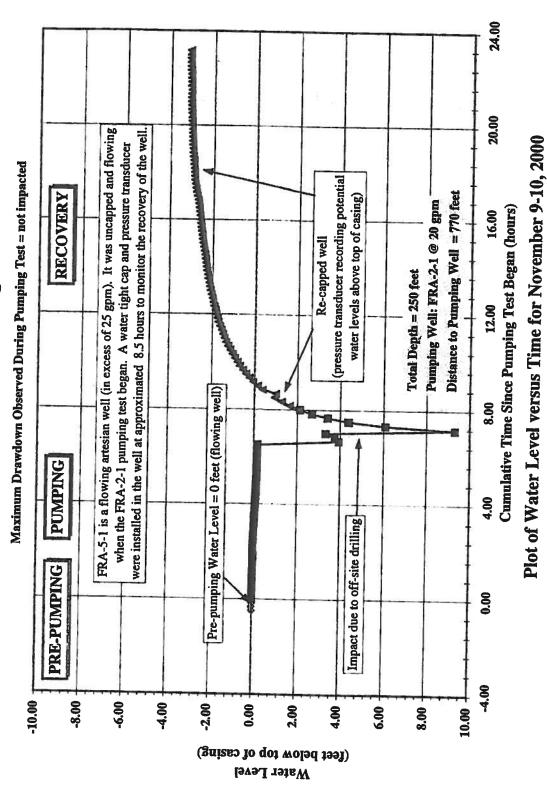


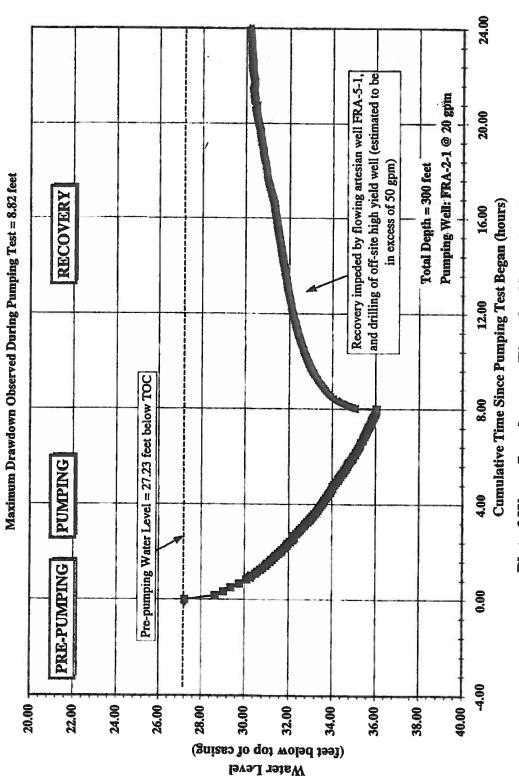
Saddle Ridge A-3 Subdivision

Loudoun County, Virginia

Saddle Ridge A-3 Subdivision Loudoun County, Virginia

FRA-5-1 Monitoring Well





Plot of Water Level versus Time for November 9-10, 2000 Saddle Ridge A-3 Subdivision Loudoun County, Virginia

Appendix D

**EDR Report** 

# EDR Radius Map<sup>TM</sup> Report

Prepared using the EDR FieldCheck® System

Hamilton Well Site 38146 Stone Eden Dr Hamilton, VA 20158

Inquiry Number: 2043592.1s

October 09, 2007



# The Standard in Environmental Risk Information

440 Wheelers Farms Road Milford, Connecticut 06461

#### **Nationwide Customer Service**

Telephone: 1-800-352-0050 Fax: 1-800-231-6802 Internet: www.edrnet.com

#### **TABLE OF CONTENTS**

SECTION	PAGE
Executive Summary	. ES1
Overview Map	. 2
Detail Map	. 3
Map Findings Summary	. 4
Map Findings	. 6
Orphan Summary	7
Government Records Searched/Data Currency Tracking	

#### **GEOCHECK ADDENDUM**

**GeoCheck - Not Requested** 

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

#### Disclaimer - Copyright and Trademark Notice

The EDR FieldCheck <sup>®</sup>System enables EDR's customers to make certain online modifications to the maps and text contained in EDR Radius Map Reports. As a result, the maps and text contained in this Report may have been so modified. EDR has not taken any action to verify any such modifications, and this report and the findings set forth herein must be read in light of this fact. The EDR FieldCheck System accesses user-modified records from previously submitted reports. Any user-modified record from a previous report that is plotted outside the search radius of this report may not be included in this report.

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2007 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

#### **EXECUTIVE SUMMARY**

A search of the environmental records was conducted by Environmental Data Resources, Inc. (EDR). ANALYTICAL SERVICES used the EDR FieldCheck System to review and/or revise the results of this search, based on independent data verification by ANALYTICAL SERVICES. The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

#### TARGET PROPERTY INFORMATION

#### **ADDRESS**

38146 STONE EDEN DR HAMILTON, VA 20158

#### **COORDINATES**

Latitude (North): Longitude (West): 39.124000 - 39" 7' 26.4" 77.681500 - 77\* 40' 53.4"

Universal Tranverse Mercator: Zone 18 UTM X (Meters): UTM Y (Meters):

268186.7 4333753.0

Elevation:

450 ft. above sea level

#### **USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY**

Target Property Map:

39077-B6 PURCELLVILLE, VA

Most Recent Revision: 1984

39077-A6 LINCOLN, VA

Most Recent Revision:

1984

#### **TARGET PROPERTY SEARCH RESULTS**

South Map:

The target property was not listed in any of the databases searched by EDR.

#### **DATABASES WITH NO MAPPED SITES**

No sites were identified in following databases.

#### **FEDERAL RECORDS**

NPL National Priority List

Proposed NPL Proposed National Priority List Sites Delisted NPL National Priority List Deletions

NPL LIENS..... Federal Superfund Liens

CERC-NFRAP. CERCLIS No Further Remedial Action Planned

CORRACTS...... Corrective Action Report

RCRA-TSDF Resource Conservation and Recovery Act Information

#### **EXECUTIVE SUMMARY**

#### EDR PROPRIETARY RECORDS

Manufactured Gas Plants... EDR Proprietary Manufactured Gas Plants

# SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

Unmappable (orphan) sites are not considered in the foregoing analysis.

#### **EXECUTIVE SUMMARY**

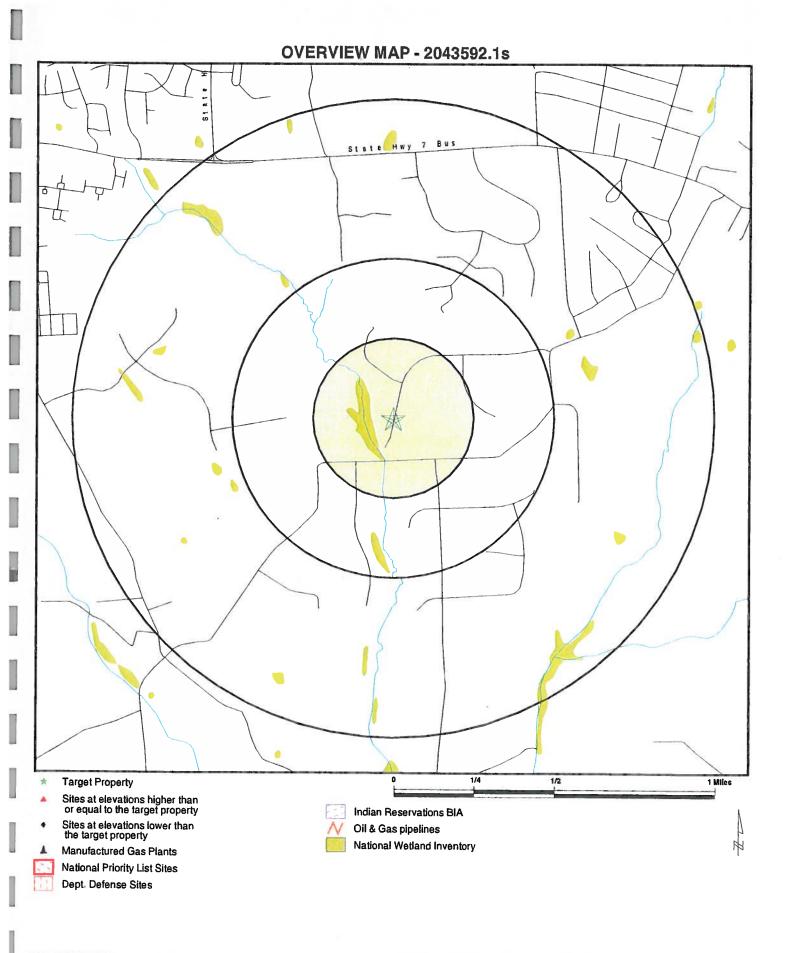
Due to poor or inadequate address information, the following sites were not mapped:

Site	Name
------	------

PHOENIX DEVELOPMENT SITE ECKHAUS MOTORS
LACOCK CARROLL B ESTATE
HAMILTON TOWN WELL 7
LOUDOUN VALLEY HIGH SCHOOL
BENNY WERNER
CULLINANE MICHAEL
AT & T LONG LINES EQUIPMENT ENG
HAMILTON RIDGE
HAMILTON STP
UNSPECIFIED CONSTRUCTION SITE
HAMILTON WWTP
TOWN OF HAMILTON STP
HAMILTON WWTP

#### Database(s)

CERC-NFRAP LUST LTANKS LTANKS FINDS, LTANKS UST UST RCRA-SQG, FINDS FINDS VA Spills VA Spills VA Spills VA Spills

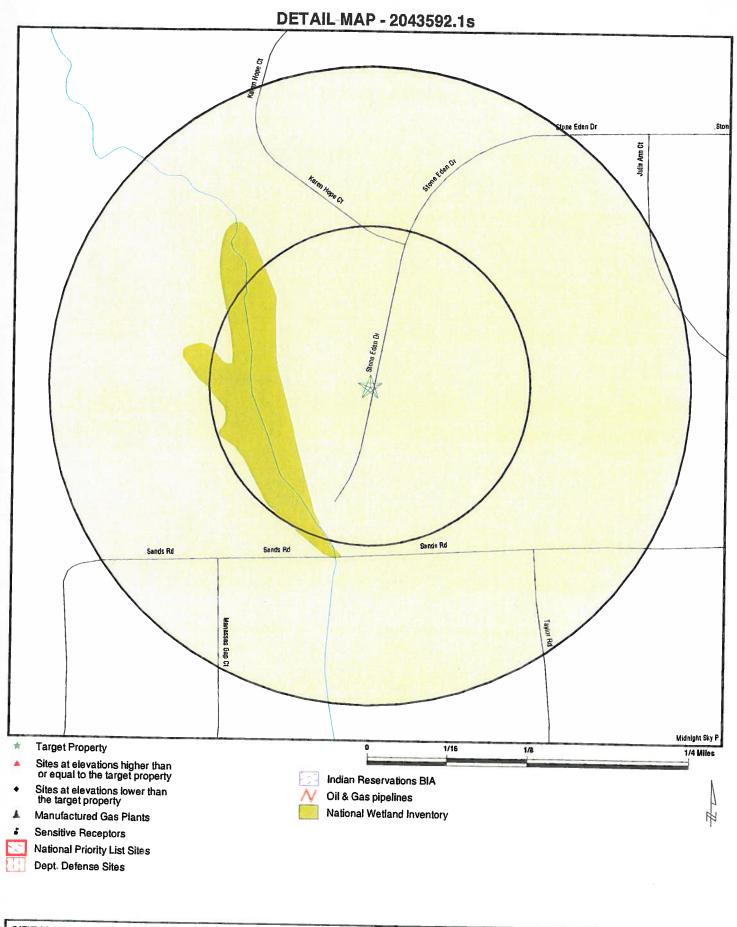


SITE NAME: Hamilton Well Site
ADDRESS: 38146 Stone Eden Dr
Hamilton VA 20158
LAT/LONG: 39.1240 / 77.6815

CLIENT: Analytical Services CONTACT: Andrew Carter INQUIRY #: 2043592.1s

DATE:

October 09, 2007 9:23 am
Copyright © 2007 EDR. Inc. © 2007 Tele Atlas Rel. 07/2006.



SITE NAME: Hamilton Well Site
ADDRESS: 38146 Stone Eden Dr
Hamilton VA 20158
LAT/LONG: 39.1240 / 77.6815

CLIENT: Analytical Services
CONTACT: Andrew Carter
INQUIRY#: 2043592.1s
DATE: October 09, 2007 9:23 am

Copyright © 2007 EDR, Inc. © 2007 Tele Atlas Rel. 07/2006.

# **MAP FINDINGS SUMMARY**

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL Proposed NPL Delisted NPL NPL LIENS CERCLIS CERC-NFRAP CORRACTS RCRA TSD RCRA Lg. Quan. Gen. RCRA Sm. Quan. Gen. ERNS HMIRS US ENG CONTROLS US INST CONTROL DOD FUDS US BROWNFIELDS CONSENT ROD UMTRA ODI TRIS TSCA FTTS SSTS LUCIS DOT OPS ICIS HIST FTTS CDL RADINFO LIENS 2		1.000 1.000 1.000 1.000 1.000 0.500 0.500 0.250 0.250 TP TP 0.500 0.500 1.000 1.000 1.000 0.500 1.000 TP	0002200000220000000022220222222	000K00000KR000000000KRKKKKKKKKKKKKKKKK	000R000RRRRRR000000000RRRRRRRRRRRRRRRR	000222222222222222222222222222222222222	X X X X X X X X X X X X X X X X X X X	000000000000000000000000000000000000000
PADS MLTS MINES FINDS RAATS		TP TP 0.250 TP TP	NR NR O NR NR	NR NR 0 NR NR	NR NR NR NR NR	NR NR NR NR NR	NR NR NR NR NR	0 0 0 0
STATE AND LOCAL RECORD	<u>os</u>							
State Haz. Waste State Landfill LUST LTANKS UST AST VA Spills ENG CONTROLS		N/A 0.500 0.500 0.500 0.250 TP 0.500	N/A 0 0 0 0 0 NR 0	N/A 0 0 0 0 0 0 NR 0	N/A 0 0 0 NR NR NR NR	N/A NR NR NR NR NR NR NR	N/A NR NR NR NR NR NR	N/A 0 0 0 0 0 0

# **MAP FINDINGS SUMMARY**

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INST CONTROL VRP DRYCLEANERS BROWNFIELDS ENF CEDS AIRS		0.500 0.500 0.250 0.500 TP TP TP	0 0 0 0 NR NR NR	0 0 0 0 NR NR NR	0 0 NR 0 NR NR NR	NR NR NR NR NR NR	NR NR NR NR NR NR	0 0 0 0 0 0
TRIBAL RECORDS								
INDIAN RESERV INDIAN LUST INDIAN UST		1.000 0.500 0.250	0 0 0	0 0 0	0 0 NR	0 NR NR	NR NR NR	0 0 0
EDR PROPRIETARY RECOR	DS							
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

#### NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Map ID
Direction
Distance
Distance (ft.)
Elevation
Site

MAP FINDINGS

EDR ID Number
EDR ID Number
EPA ID Number

NO SITES FOUND

# ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	dIZ	Database(s)
HAMILTON HORELLVILLE PURCELLVILLE PURCELLVILLE	1003866849 S105095764 S108326431 S107472236 S108327581 S108327055 S108327592 1008338144 S105982995 U003680912 1000137322	1003866849 PHOENIX DEVELOPMENT SITE 510857654 LACOCK CARROLL B ESTATE 5108576536 HAMILTON STP 510832631 UNSPECIFIED CONSTRUCTION SITE 5107472236 HAMILTON TOWN WELL 7 5108327581 HAMILTON WWTP 5108327552 HAMILTON WWTP 5108327552 HAMILTON WWTP 5108327592 HAMILTON WWTP 6105338144 HAMILTON RIDGE 5105982995 ECKHAUS MOTORS 1003682460 BENNY WERNER 1000368240 BENNY WERNER 1000368240 CULLINANE MICHAEL 1000137322 AT & TLONG LINES EQUIPMENT ENG	RT. 607 & RT. 50 BUSINESS ROUTE 7 AND ROGERS ST 53 COLONIAL HWY HAMPTON ROAD 127 ST PAUL ST 104 ROGERS STREET 104 N. ROGERS STREET 17939 TAYLOR ROAD 459 EAST COLONIAL HIGHWAY ROUTE 1 BOX 650 ROUTE 1 BOX 487 ROUTE 1 BOX 141	22068 20158 1 20159 1 20159 20159 20159 20158 8 20158 8 20158 8 20132 6 20132	CERC-NFRAP LTANKS VA Spilis VA Spili

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

#### **FEDERAL RECORDS**

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/18/2007 Date Data Arrived at EDR: 08/03/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 26

Source: EPA Telephone: N/A

Last EDR Contact: 07/31/2007

Next Scheduled EDR Contact: 10/29/2007 Data Release Frequency: Quarterly

#### **NPL Site Boundaries**

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)

Telephone: 202-564-7333

EPA Region 1

Telephone 617-918-1143

**EPA Region 3** 

Telephone 215-814-5418

EPA Region 4

Telephone 404-562-8033

EPA Region 5

Telephone 312-886-6686

**EPA Region 10** 

Telephone 206-553-8665

EPA Region 6

Telephone: 214-655-6659

**EPA Region 7** 

Telephone: 913-551-7247

**EPA Region 8** 

Telephone: 303-312-6774

**EPA Region 9** 

Telephone: 415-947-4246

#### Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/20/2007 Date Data Arrived at EDR: 05/03/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 63

Source: EPA Telephone: N/A

Last EDR Contact: 08/31/2007

Next Scheduled EDR Contact: 10/29/2007 Data Release Frequency: Quarterly

#### **DELISTED NPL:** National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/20/2007 Date Data Arrived at EDR: 05/03/2007 Date Made Active in Reports: 06/25/2007 Number of Days to Update: 53

Source: EPA Telephone: N/A

Last EDR Contact: 08/29/2007

Next Scheduled EDR Contact: 10/29/2007 Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991 Date Data Arrived at EDR: 02/02/1994 Date Made Active in Reports: 03/30/1994

Number of Days to Update: 56

Source: EPA

Telephone: 202-564-4267 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are In the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/23/2007 Date Data Arrived at EDR: 06/20/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 70

Source: EPA

Telephone: 703-412-9810 Last EDR Contact: 09/19/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to llst this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 06/21/2007 Date Data Arrived at EDR: 07/23/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 37

Source: EPA

Telephone: 703-412-9810 Last EDR Contact: 09/17/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Quarterly

**CORRACTS:** Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/26/2007 Date Data Arrived at EDR: 08/08/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 21

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 09/04/2007

Next Scheduled EDR Contact: 12/03/2007 Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/13/2006 Date Data Arrived at EDR: 06/28/2006 Date Made Active in Reports: 08/23/2006

Number of Days to Update: 56

Source: EPA

Telephone: 800-438-2474 Last EDR Contact: 09/04/2007

Next Scheduled EDR Contact: 10/15/2007 Data Release Frequency: Quarterly

#### ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2006 Date Data Arrived at EDR: 01/24/2007 Date Made Active in Reports: 03/12/2007

Number of Days to Update: 47

Source: National Response Center, United States Coast Guard

Telephone: 202-267-2180 Last EDR Contact: 07/23/2007

Next Scheduled EDR Contact: 10/22/2007 Data Release Frequency: Annually

#### HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 07/02/2007 Date Data Arrived at EDR: 07/18/2007 Date Made Active in Reports: 09/18/2007

Number of Days to Update: 62

Source: U.S. Department of Transportation

Telephone: 202-366-4555 Last EDR Contact: 07/18/2007

Next Scheduled EDR Contact: 10/15/2007 Data Release Frequency: Annually

#### US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 04/20/2007 Date Data Arrived at EDR: 04/26/2007 Date Made Active in Reports: 05/25/2007

Number of Days to Update: 29

Source: Environmental Protection Agency

Telephone: 703-603-8905 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Varies

#### US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 04/20/2007 Date Data Arrived at EDR: 04/26/2007 Date Made Active in Reports: 05/25/2007

Number of Days to Update: 29

Source: Environmental Protection Agency Telephone: 703-603-8905 Last EDR Contact: 10/01/2007 Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Varies

**DOD:** Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 11/10/2006 Date Made Active In Reports: 01/11/2007

Number of Days to Update: 62

Source: USGS Telephone: 703-692-8801 Last EDR Contact: 08/09/2007

Next Scheduled EDR Contact: 11/05/2007 Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 09/20/2006 Date Made Active in Reports: 11/22/2006

Number of Days to Update: 63

Source: U.S. Army Corps of Engineers

Telephone: 202-528-4285 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities-especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 06/20/2007 Date Data Arrived at EDR: 07/09/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 51

Source: Environmental Protection Agency

Telephone: 202-566-2777 Last EDR Contact: 09/10/2007

Next Scheduled EDR Contact: 12/10/2007 Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 04/13/2007 Date Data Arrived at EDR: 07/16/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 44

Source: Department of Justice, Consent Decree Library Telephone: Varies

Last EDR Contact: 08/23/2007

Next Scheduled EDR Contact: 10/22/2007

Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 06/08/2007 Date Data Arrived at EDR: 07/03/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 57

Source: EPA Telephone: 703-416-0223

Last EDR Contact: 10/01/2007 Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Annually

**UMTRA:** Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 11/08/2006 Date Made Active in Reports: 01/29/2007

Number of Days to Update: 82

Source: Department of Energy Telephone: 505-845-0011 Last EDR Contact: 09/19/2007

Next Scheduled EDR Contact: 12/17/2007

Data Release Frequency: Varies

**ODI:** Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985 Date Data Arrived at EDR: 08/09/2004 Date Made Active in Reports: 09/17/2004

Number of Days to Update: 39

Source: Environmental Protection Agency

Telephone: 800-424-9346 Last EDR Contact: 06/09/2004 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 04/27/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 69

Source: EPA

Telephone: 202-566-0250 Last EDR Contact: 09/18/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant

Date of Government Version: 12/31/2002 Date Data Arrived at EDR: 04/14/2006 Date Made Active in Reports: 05/30/2006

Number of Days to Update: 46

Source: EPA

Telephone: 202-260-5521 Last EDR Contact: 07/30/2007

Next Scheduled EDR Contact: 10/15/2007 Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/06/2007 Date Data Arrived at EDR: 07/20/2007 Date Made Active in Reports: 09/18/2007 Number of Days to Update: 60

Source: EPA/Office of Prevention, Pesticides and Toxic Substances Telephone: 202-566-1667

Last EDR Contact: 09/17/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 07/06/2007 Date Data Arrived at EDR: 07/20/2007 Date Made Active in Reports: 09/18/2007 Number of Days to Update: 60

Source: EPA

Telephone: 202-566-1667 Last EDR Contact: 09/17/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Quarterly

#### SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 03/13/2007 Date Made Active in Reports: 04/27/2007

Number of Days to Update: 45

Source: EPA

Telephone: 202-564-4203 Last EDR Contact: 07/16/2007

Next Scheduled EDR Contact: 10/15/2007 Data Release Frequency: Annually

#### LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005 Date Data Arrived at EDR: 12/11/2006 Date Made Active in Reports: 01/11/2007

Number of Days to Update: 31

Source: Department of the Navy Telephone: 843-820-7326 Last EDR Contact: 09/12/2007

Next Scheduled EDR Contact: 12/10/2007 Data Release Frequency: Varies

#### **DOT OPS:** Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 05/14/2007 Date Data Arrived at EDR: 05/30/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 36

Source: Department of Transporation, Office of Pipeline Safety

Telephone: 202-366-4595 Last EDR Contact: 08/29/2007

Next Scheduled EDR Contact: 11/26/2007 Data Release Frequency: Varies

#### ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 06/29/2007 Date Data Arrived at EDR: 07/02/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 58

Source: Environmental Protection Agency

Telephone: 202-564-5088 Last EDR Contact: 06/22/2007

Next Scheduled EDR Contact: 07/16/2007 Data Release Frequency: Quarterly

#### HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and RodentIcide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006 Date Data Arrived at EDR: 03/01/2007 Date Made Active in Reports: 04/10/2007

Number of Days to Update: 40

Source: Environmental Protection Agency

Telephone: 202-564-2501 Last EDR Contact: 09/17/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: No Update Planned

#### CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/01/2006 Date Data Arrived at EDR: 01/08/2007 Date Made Active in Reports: 01/11/2007

Number of Days to Update: 3

Source: Drug Enforcement Administration

Telephone: 202-307-1000 Last EDR Contact: 10/02/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Quarterly

**RADINFO: Radiation Information Database** 

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/31/2007 Date Data Arrived at EDR: 08/01/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 28

Source: Environmental Protection Agency

Telephone: 202-343-9775 Last EDR Contact: 08/01/2007

Next Scheduled EDR Contact: 10/29/2007 Data Release Frequency: Quarterly

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides Information as to the identity of these sites and properties.

Date of Government Version: 03/08/2007 Date Data Arrived at EDR: 04/12/2007 Date Made Active in Reports: 05/14/2007

Number of Days to Update: 32

Source: Environmental Protection Agency Telephone: 202-564-6023

Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 04/12/2007 Date Data Arrived at EDR: 06/08/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 82

Source: EPA

Telephone: 202-566-0500 Last EDR Contact: 08/09/2007

Next Scheduled EDR Contact: 11/05/2007 Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/09/2007 Date Data Arrived at EDR: 07/24/2007 Date Made Active in Reports: 09/18/2007

Number of Days to Update: 56

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 05/09/2007 Date Data Arrived at EDR: 06/28/2007 Date Made Active in Reports: 08/29/2007

Number of Days to Update: 62

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959 Last EDR Contact: 09/26/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/19/2007 Date Data Arrived at EDR: 07/25/2007 Date Made Active in Reports: 09/18/2007

Number of Days to Update: 55

Source: EPA

Telephone: (215) 814-5000 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database

Date of Government Version: 04/17/1995 Date Data Arrived at EDR: 07/03/1995 Date Made Active in Reports: 08/07/1995

Number of Days to Update: 35

Source: EPA

Telephone: 202-564-4104 Last EDR Contact: 08/31/2007

Next Scheduled EDR Contact: 12/03/2007 Data Release Frequency: No Update Planned

**BRS:** Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 03/06/2007 Date Made Active in Reports: 04/13/2007

Number of Days to Update: 38

Source: EPA/NTIS Telephone: 800-424-9346 Last EDR Contact: 09/12/2007

Next Scheduled EDR Contact: 12/10/2007 Data Release Frequency: Biennially

USGS WATER WELLS: National Water Information System (NWIS)

This database consists of well records in the United States. Available site descriptive information includes well location information (latitude and longitude, well depth, site use, water use, and aquifer).

Date of Government Version: 03/25/2005 Date Data Arrived at EDR: 03/25/2005 Date Made Active in Reports: N/A Number of Days to Update: 0

Source: USGS Telephone: N/A

Last EDR Contact: 03/25/2005 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

PWS: Public Water System Data

This Safe Drinking Water Information System (SDWIS) file contains public water systems name and address, population served and the primary source of water

Date of Government Version: 02/24/2000 Date Data Arrived at EDR: 04/27/2005 Date Made Active in Reports: N/A

Number of Days to Update: 0

Source: EPA Telephone: N/A

Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007

Data Release Frequency: N/A

STATE AND LOCAL RECORDS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A Date Data Arrived at EDR: N/A Date Made Active in Reports: N/A Number of Days to Update: N/A

Source: Department of Environmental Quality Telephone: 804-698-4236

Last EDR Contact: 07/16/2007

Next Scheduled EDR Contact: 10/15/2007

Data Release Frequency: N/A

Date of Government Version: 07/10/2007 Date Data Arrived at EDR: 08/03/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 19

Source: Department of Environmental Quality, West Central Region

Telephone: 540-562-6700 Last EDR Contact: 09/24/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: No Update Planned

#### SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 06/22/2007 Date Data Arrived at EDR: 07/25/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 28

Source: Department of Environmental Quality, Valley Regional Office Telephone: 540-574-7800

Last EDR Contact: 09/24/2007 Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Quarterly

#### SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to alr, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/28/2005 Date Data Arrived at EDR: 02/01/2005 Date Made Active in Reports: 03/03/2005 Number of Days to Update: 30

Source: Department of Environmental Quality, Tidewater Region

Telephone: 757-518-2177 Last EDR Contact: 09/24/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Quarterly

#### SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/22/2006 Date Data Arrived at EDR: 08/24/2006 Date Made Active in Reports: 10/03/2006 Number of Days to Update: 40 Source: Department of Environmental Quality, Southwest Region

Telephone: 276-676-4839 Last EDR Contact: 08/06/2007

Next Scheduled EDR Contact: 11/05/2007 Data Release Frequency: No Update Planned

#### SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 04/25/2002 Date Data Arrived at EDR: 05/01/2002 Date Made Active in Reports: 05/31/2002 Number of Days to Update: 30

Source: Department of Environmental Quality, Piedmont Region

Telephone: 804-527-5020 Last EDR Contact: 08/27/2007

Next Scheduled EDR Contact: 11/26/2007 Data Release Frequency: Quarterly

#### SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 07/11/2007 Date Data Arrived at EDR: 07/16/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 37 Source: Department of Environmental Quality, Northern Region

Telephone: 703-583-3864 Last EDR Contact: 09/24/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: No Update Planned

#### SPILLS: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996 Date Data Arrived at EDR: 10/22/1996 Date Made Active in Reports: 11/21/1996 Number of Days to Update: 30

Source: Department of Environmental Quality Telephone: 804-698-4297

Last EDR Contact: 09/25/1996 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

#### **ENG CONTROLS:** Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/25/2007 Date Data Arrived at EDR: 07/27/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 26

Source: Department of Environmental Quality Telephone: 804-698-4228

Last EDR Contact: 07/23/2007

Next Scheduled EDR Contact: 10/22/2007 Data Release Frequency: Quarterly

#### INST CONTROL: Voluntary Remediation Program Database

Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 07/25/2007 Date Data Arrived at EDR: 07/27/2007 Date Made Active in Reports: 08/22/2007 Source: Department of Environmental Quality Telephone: 804-698-4228

Last EDR Contact: 07/23/2007

Number of Days to Update: 26

Next Scheduled EDR Contact: 10/22/2007 Data Release Frequency: Quarterly

#### VRP: Voluntary Remediation Program

The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 07/25/2007 Date Data Arrived at EDR: 07/27/2007 Date Made Active in Reports: 08/22/2007 Source: Department of Environmental Quality

Telephone: 804-698-4228 Last EDR Contact: 07/23/2007

Number of Days to Update: 26

Next Scheduled EDR Contact: 10/22/2007 Data Release Frequency: Quarterly

#### **DRYCLEANERS:** Drycleaner List A listing of registered drycleaners.

Date of Government Version: 01/17/2007 Date Data Arrived at EDR: 01/17/2007 Date Made Active in Reports: 01/30/2007

Number of Days to Update: 13

Source: Department of Environmental Quality

Telephone: 804-698-4407 Last EDR Contact: 09/24/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Varies

#### **BROWNFIELDS:** Brownfields Site Specific Assessments

To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental

Date of Government Version: 08/27/2007 Date Data Arrived at EDR: 08/28/2007 Date Made Active in Reports: 09/12/2007 Number of Days to Update: 15

Source: Department of Environmental Quality

Telephone: 804-698-4207 Last EDR Contact: 08/21/2007

Next Scheduled EDR Contact: 11/19/2007

Data Release Frequency: Varies

**ENFORCEMENT:** Enforcement Actions Data A listing of enforcement actions.

Date of Government Version: 06/29/2007 Date Data Arrived at EDR: 08/03/2007 Date Made Active in Reports: 09/12/2007 Number of Days to Update: 40

Source: Department of Environmental Quality

Telephone: 804-698-4031 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007

Data Release Frequency: Varies

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 07/05/2007 Date Data Arrived at EDR: 07/05/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 48

Source: Department of Environmental Quality

Telephone: 804-698-4077 Last EDR Contact: 10/01/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Semi-Annually

AiRS: Permitted Airs Facility List
A listing of permitted Airs facilities.

Date of Government Version: 06/30/2007 Date Data Arrived at EDR: 07/05/2007 Date Made Active in Reports: 08/22/2007 Number of Days to Update: 48

Source: Department of Environmental Quality

Telephone: 804-698-4000 Last EDR Contact: 09/24/2007

Next Scheduled EDR Contact: 12/24/2007 Data Release Frequency: Varies

TRIBAL RECORDS

**INDIAN RESERV:** Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 12/08/2006 Date Made Active in Reports: 01/11/2007 Number of Days to Update: 34

Source: USGS

Telephone: 202-208-3710 Last EDR Contact: 08/09/2007

Next Scheduled EDR Contact: 11/05/2007 Data Release Frequency: Semi-Annually

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 03/20/2007 Date Data Arrived at EDR: 04/16/2007 Date Made Active in Reports: 05/14/2007 Number of Days to Update: 28

Source: EPA Region 4 Telephone: 404-562-8677 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Semi-Annually

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming

Date of Government Version: 05/30/2007 Date Data Arrived at EDR: 05/31/2007 Date Made Active in Reports: 07/05/2007 Number of Days to Update: 35

Source: EPA Region 8 Telephone: 303-312-6271 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 06/18/2007 Date Data Arrived at EDR: 06/18/2007 Date Made Active in Reports: 07/05/2007 Number of Days to Update: 17

Source: Environmental Protection Agency Telephone: 415-972-3372 Last EDR Contact: 08/20/2007 Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land A listing of leaking underground storage tank locations on Indian Land

Date of Government Version: 12/01/2006 Date Data Arrived at EDR: 12/01/2006 Date Made Active in Reports: 01/29/2007

Number of Days to Update: 59

Source: EPA Region 1 Telephone: 617-918-1313 Last EDR Contact: 08/20/2007 Next Scheduled EDR Contact: 11/19/2007

Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land In New Mexico and Oklahoma.

Date of Government Version: 01/04/2005 Date Data Arrived at EDR: 01/21/2005 Date Made Active in Reports: 02/28/2005

Number of Days to Update: 38

Source: EPA Region 6 Telephone: 214-665-6597 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/23/2007 Date Data Arrived at EDR: 05/24/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 42

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2007 Date Data Arrived at EDR: 06/14/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 21

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 12/02/2004 Date Data Arrived at EDR: 12/29/2004 Date Made Active in Reports: 02/04/2005

Number of Days to Update: 37

Source: EPA Region 5 Telephone: 312-886-6136 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 05/23/2007 Date Data Arrived at EDR: 05/24/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 42

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land A listing of underground storage tank locations on Indian Land.

Date of Government Version: 12/01/2006 Date Data Arrived at EDR: 12/01/2006 Date Made Active in Reports: 01/29/2007

Number of Days to Update: 59

Source: EPA, Region 1 Telephone: 617-918-1313 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

#### INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 06/06/2007 Date Data Arrived at EDR: 06/07/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 28

Source: EPA Region 6 Telephone: 214-665-7591 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Semi-Annually

#### INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2007 Date Data Arrived at EDR: 06/14/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 21

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Varies

#### INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 06/18/2007 Date Data Arrived at EDR: 06/18/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 17

Source: EPA Region 9 Telephone: 415-972-3368 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

#### INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 05/30/2007 Date Data Arrived at EDR: 05/31/2007 Date Made Active in Reports: 07/05/2007

Number of Days to Update: 35

Source: EPA Region 8 Telephone: 303-312-6137 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Quarterly

#### INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 03/20/2007 Date Data Arrived at EDR: 04/16/2007 Date Made Active in Reports: 05/14/2007

Number of Days to Update: 28

Source: EPA Region 4 Telephone: 404-562-9424 Last EDR Contact: 08/20/2007

Next Scheduled EDR Contact: 11/19/2007 Data Release Frequency: Semi-Annually

### **EDR PROPRIETARY RECORDS**

### Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A Date Data Arrived at EDR: N/A Date Made Active in Reports: N/A Number of Days to Update: N/A

Source: EDR, Inc. Telephone: N/A Last EDR Contact: N/A

Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

#### **FEDERAL RECORDS**

**MEDICAL CENTERS:** Provider of Services Listing

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal

agency within the U.S. Department of Health & Human Services.

Date of Government Version: 06/01/1998
Date Data Arrived at EDR: 11/10/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000 Last EDR Contact: 01/12/2007 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

**NURSING HOMES:** Directory of Nursing Homes

Information on Medicare and Medicaid certified nursing homes in the United States.

Date of Government Version: N/A
Date Data Arrived at EDR: 10/11/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Telephone: 800-568-3282 Last EDR Contact: 09/22/2006 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

PRIVATE SCHOOLS: Private Schools of the United States

The National Center for Education Statistics' primary database on private school locations in the United States.

Source: N/A

Date of Government Version: N/A
Date Data Arrived at EDR: 10/07/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: National Center for Education Statistics

Telephone: 202-502-7300 Last EDR Contact: 09/22/2006 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

**HOSPITALS:** AHA Hospital Guide

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Date of Government Version: N/A
Date Data Arrived at EDR: 10/19/1994
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: American Hospital Association

Telephone: 800-242-2626 Last EDR Contact: 09/22/2006 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

**PUBLIC SCHOOLS: Public Schools** 

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/13/2004
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: National Center for Education statistics

Telephone: 202-502-7300 Last EDR Contact: 07/11/2007

Next Scheduled EDR Contact: 10/08/2007

Data Release Frequency: N/A

**COLLEGES:** Integrated Postsecondary Education Data

The National Center for Education Statistics' primary database on integrated postsecondary education in the United States.

Date of Government Version: N/A
Date Data Arrived at EDR: 10/12/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: National Center for Education Statistics

Telephone: 202-502-7300 Last EDR Contact: 09/22/2006 Next Scheduled EDR Contact: N/A Data Release Frequency: N/A

#### OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 06/15/2007 Date Made Active in Reports: 08/20/2007

Number of Days to Update: 66

Source: Department of Environmental Protection

Telephone: 860-424-3375 Last EDR Contact: 09/12/2007

Next Scheduled EDR Contact: 12/10/2007 Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 04/01/2007 Date Data Arrived at EDR: 04/05/2007 Date Made Active in Reports: 05/08/2007

Number of Days to Update: 33

Source: Department of Environmental Protection

Telephone: N/A

Last EDR Contact: 10/02/2007

Next Scheduled EDR Contact: 12/31/2007 Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 08/27/2007 Date Data Arrived at EDR: 08/30/2007 Date Made Active in Reports: 09/21/2007

Number of Days to Update: 22

Source: Department of Environmental Conservation

Telephone: 518-402-8651 Last EDR Contact: 08/30/2007

Next Scheduled EDR Contact: 11/26/2007 Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2006 Date Data Arrived at EDR: 08/23/2007 Date Made Active In Reports: 09/27/2007

Number of Days to Update: 35

Source: Department of Environmental Protection

Telephone: N/A

Last EDR Contact: 09/10/2007

Next Scheduled EDR Contact: 12/10/2007 Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 04/09/2007 Date Data Arrived at EDR: 04/12/2007 Date Made Active in Reports: 04/27/2007

Number of Days to Update: 15

Source: Department of Environmental Management

Telephone: 401-222-2797 Last EDR Contact: 09/17/2007

Next Scheduled EDR Contact: 12/17/2007 Data Release Frequency: Annually

Wi MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2006 Date Data Arrived at EDR: 04/27/2007 Date Made Active in Reports: 06/08/2007

Number of Days to Update: 42

Source: Department of Natural Resources

Telephone: N/A

Last EDR Contact: 07/09/2007

Next Scheduled EDR Contact: 10/08/2007 Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

### **Electric Power Transmission Line Data**

Source: PennWell Corporation Telephone: (800) 823-6277

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

TC2043592.1s Page GR-17

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

#### AHA Hospitais:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

#### Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services,

a federal agency within the U.S. Department of Health and Human Services.

#### **Nursing Homes**

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

#### **Public Schools**

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary

and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

#### **Private Schools**

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

# Daycare Centers: Licensed Facilities Source: Department of Social Services

Telephone: 804-692-1900

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

### STREET AND ADDRESS INFORMATION

© 2007 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

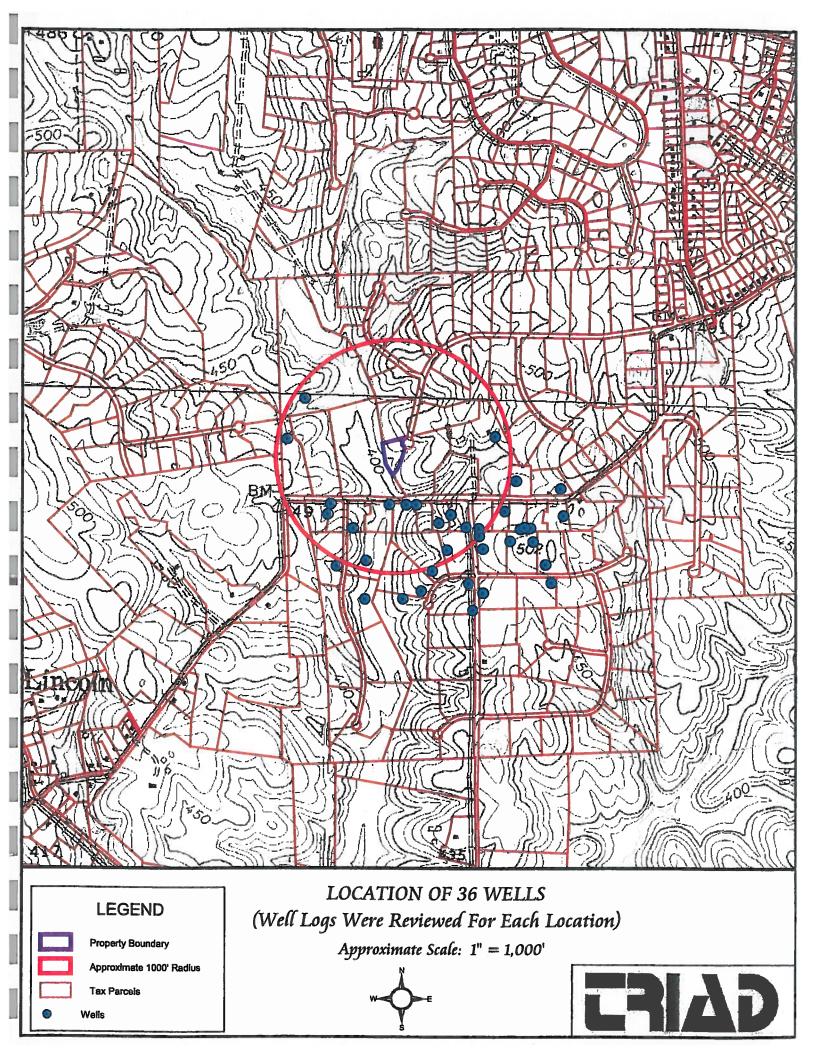
# Appendix E

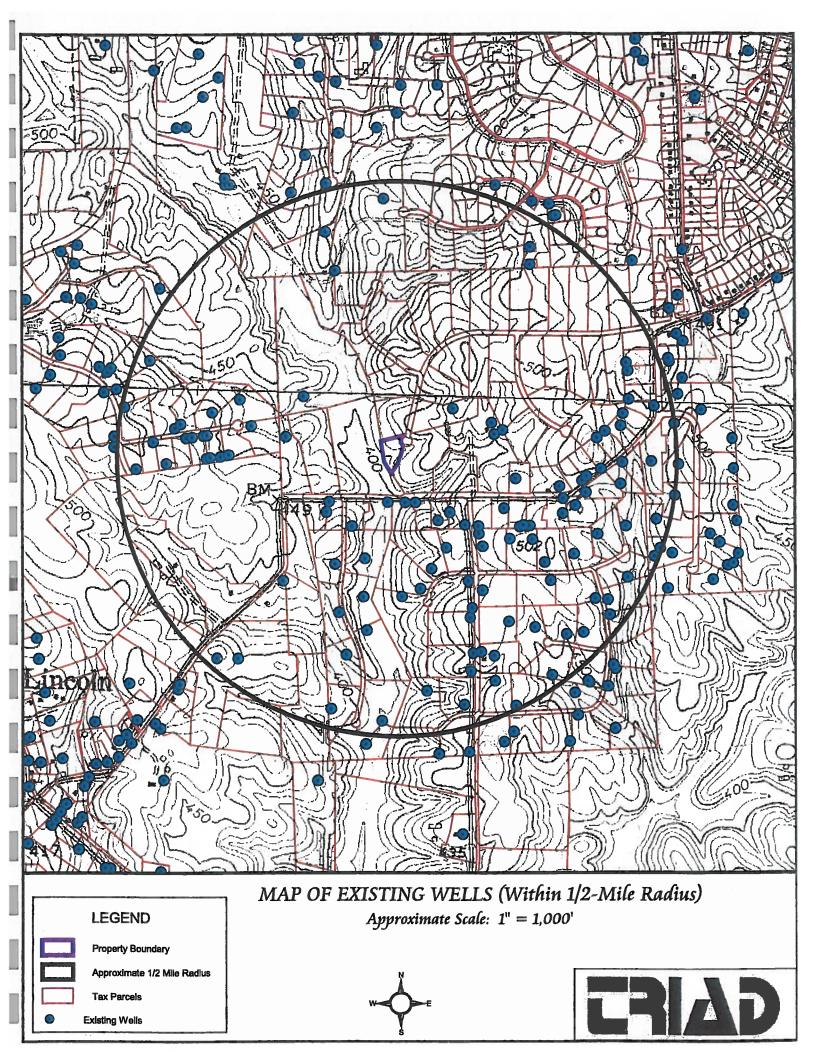
Loudoun County Health Department Well Log Summary

## Well Log Summary for 36 Nearby Wells

Parcel Identification Number	Well Yield (gpm)	Total Depth (feet)	Depth to Bedrock (feet)	Static Water Level (feet)	Water-Bearing Depths (feet)**
454297930	15	380	25	2	365
455406784	60	300	20	30	283
454102078	25	50	25	25	275
454104178	15	300	50	30	278
454105978	60	383	50	30	381
454108379	20	250	8	30	222
419150980	50	250	8	0	225
419153482	30	275	10	30	253
419155183	30	400	10	12	190 (4), 360 (26)
419157282*	60	435	30	30	137, 432
	50	380	20	30	180 (2), 365 (48)
419159786	12	500	10	12	460
419161586	15	400	10	12	180 (2), 360 (13)
419163486	75	406	22	NA	393
	20	400	20	30	381
419164887	30	450	20	30	201,369,423
419164887	30	425	25	30	405
419167188	30	300	30	30	131,270
419166947	10	450	40	30	427
419163547	15	225	20	30	195
419160643*	30	325	40	30	306, 310
	10	266	35	NA	103 (3), 183 (7)
419157547	50	320	40	30	295
419153840	45	300	15	17	230 (5), 260 (40)
419151414	40	220	10	12	130 (4), 180 (36)
454106737	10	300	40	30	141
454103235	8	250	45	50	190
419165005	7	300	30	30	271
419266325	3	300	NA	NA	NA NA
419260463	30	200	10	30	134
454302227	15	260	51	40	235
419161505	5	406	35	NA	167 (2), 326 (3)
420457298*	7	800	10	12	140 (2), 760 (5)
	30	300	40	30	172, 282
420451761	10	250	20	50	150
419263427	15	640	25	50	625

Note: NA: Not Available; \*: more than one well on the property; \*\*: Figures are given in feet below ground surface, numbers in parentheses are estimated flow at each given depth.





# Appendix F

**Loudoun County Suite of Analytical Parameters** 



556 South Mansfield, Ypsilanti, MI 48197-5166 (440) 449-2525 • Fax (440) 449-8585



## ANALYTICAL REPORT

NOTE:	"*" The MCL (Maximum Contain guideline has been exce "**" Bacteria results may be information or because holding time. "ND" This contaminant was no reporting limit (LRL). "NBS" No bacteria submitted. "P" = PRESENCE "EP" = E. COLI PRESENCE "NA" = NOT ANALYZED	eeded for this of invalid due to the sample has of detected at of "NBR" NO" A" =	contamin o lack o exceede or above o Bacter ABSENCE	ant. f collection d the 30-hour  our lower ia Required.
	Analysis Performed	MCL   (mg/l)	LRL	Level Detected
	Total coliform	P	" P	NBS
	Inorganic chemicals - meta Aluminum Arsenic Barium Cadmium Calcium Chromium Copper Iron Lead Magnesium Manganese Mercury Nickel Selenium Silver Sodium Zinc	0.2 0.010 2 0.005  0.1 1.3 0.3 0.015		2



556 South Mansfield, Ypsilanti, MI 48197-5166 (440) 449-2525 • Fax (440) 449-8585



## ANALYTICAL REPORT

Page 2 of 4 Sample

Analysis performed	MCL (mg/l)	LRL	Level Detected		
Inorganic chemicals - other, as	nd physical	factors	:		
Alkalinity (Total as CaCO3) Chloride Corrosivity Fluoride Foaming Agents Hardness (as CaCO3) Nitrate as N Nitrite as N pH (Standard Units) Sulfate Total Dissolved Solids Turbidity (Turbidity Units)	10 1 6.5-8.5	5.0			
Organic chemicals - trihalomethanes:					
Bromodichloromethane Bromoform Chloroform Dibromochloromethane Total THMs	0.080	0.002 0.004 0.002 0.004 0.002			



556 South Mansfield, Ypsilanti, MI 48197-5166 (440) 449-2525 • Fax (440) 449-8585



## ANALYTICAL REPORT

# Page 3 of 4 Sample

Analysis performed	MCL (mg/l)	LRL
Organic chemicals - volatiles		
1,1,1,2-Tetrachloroethane		0.002
1,1,1-Trichloroethane	0.2	0.001
1,1,2,2-Tetrachloroethane		0.002
1,1,2-Trichloroethane	0.005	0.002
1,1-Dichloroethane 1,1-Dichloroethene	~ ~ ~	0.002
1,1-Dichloropropene	0.007	0.001
1,2,3-Trichlorobenzene		0.002
1,2,3-Trichloropropane		0.002
		0.002
1,2,4-Trichlorobenzene 1,2-Dichlorobenzene	0.07	0.002
1,2-Dichloroethane	0.6	0.001
1,2-Dichloropropane	0.005	0.001
1,3-Dichlorobenzene	0.005	0.002
1,3-Dichloropropane		0.001
1,4-Dichlorobenzene	0.075	0.002
2,2-Dichloropropane	0.075	0.001
2-Chlorotoluene	~	0.002
4-Chlorotoluene		0.001
Benzene	0.005	0.001
Bromobenzene	0.005	0.001
Bromomethane		0.002
Carbon Tetrachloride	0.005	0.002
Chlorobenzene		0.001
Chloroethane	0.1	0.001
Chloromethane		0.002
cis-1,2-Dichloroethene	0.07	0.002
cis-1,3-Dichloropropene	0.07	0.002
Dibromochloropropane (DBCP)		0.002
Dibromomethane		0.001
Dichlorodifluoromethane		0.002 0.002
Dichloromethane	0.005	
Ethylbenzene	0.005	0.002 0.001
Ethylenedibromide (EDB)	· · /	0.001
Methyl-Tert-Butyl-Ether		0.001
Styrene Styrene	0.1	0.001
Tetrachloroethene (PCE)	0.005	0.002
Toluene	1	0.001
Trans-1, 2-Dichloroethene	0.1	0.002
trans-1,3-Dichloropropene		0.002
Trichloroethene (TCE)	0.005	0.001
Trichlorofluoromethane	0.005	0.002
Vinyl Chloride	0.002	0.002
Xvlene	10	0.001
whreme	T-0	0.001



556 South Mansfield, Ypsilanti, MI 48197-5166 (440) 449-2525 • Fax (440) 449-8585



### ANALYTICAL REPORT

Page 4 of 4 Sample

Analysis performed	MCL (mg/1)	LRL	Level
Organic chemicals - pesticides,	herbicid	es and PC	Bs.
2,4-D	0.07	0.010	
Alachlor Aldrin	0.002	0.001	
Atrazine		0.002	
Chlordane	0.003		
Dichloran	0.002	0.001	
Dieldrin		0.002	
Endrin		0.001	
Heptachlor	0.002		
Heptachlor Epoxide	0.0004		
Hexachlorobenzene	0.0002		
Hexachlorocyclopentadiene	0.001	0.0005	
Lindane	0.05	0.001	
Methoxychlor	0.0002		
PCBs	0.04	0.002	
Pentachloronitrobenzene	0.0005		
Silvex(2,4,5-TP)	0.05	0.002	
Simazine	0.05 0.004	0.005	
Toxaphene	0.004	0.002	
Trifluralin	0.003	0.001	
		0.002	
THESE MESS DESITED MAY DO HODD DO		20	

THESE TEST RESULTS MAY BE USED FOR COMPLIANCE PURPOSES IN LOUDOUN COUNTY, VIRGINIA.

Rivegienta

Robert Wegienka, Lab Director

	œ.	
		1